S. HRG. 102-5 (Pt. 3)

NATIONAL ENERGY SECURITY ACT OF 1991

(Subtitle C of Title IV and Section 10003 of Title X)

HEARING

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDRED SECOND CONGRESS

FIRST SESSION

ON

S. 341

TO REDUCE THE NATION'S DEPENDENCE ON IMPORTED OIL, TO PROVIDE FOR THE ENERGY SECURITY OF THE NATION AND FOR OTHER PURPOSES

FEBRUARY 26, 1991

PART 3

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NATIONAL ENERGY SECURITY ACT OF 1991

(Subtitle C of Title IV and Section 10003 of Title X)

TUESDAY, FEBRUARY 26, 1991

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The committee met pursuant to notice, at 2:05 p.m., in room SD-366, Dirksen Senate Office Building, Hon. Bill Bradley, presiding.

OPENING STATEMENT OF HON. BILL BRADLEY, U.S. SENATOR FROM NEW JERSEY

Senator BRADLEY. The committee will come to order. The Committee on Energy and Natural Resources is conducting today the third in a series of 11 hearings on S. 341, the National Energy Security Act of 1991, which is a major bill sponsored by Senator Johnston and Senator Wallop.

Today's hearing will focus on the provisions of S. 341, which concern hydroelectric power. This bill proposes significant changes in the process under which private hydroelectric development occurs and calls on the Secretary of Energy to identify means to increase hydroelectric generation at existing Federal facilities.

At present the Nation is able to call on about 92,000 megawatts of installed hydroelectric generation capacity, which represents about 14 percent of U.S. power supply. The Federal Government owns approximately 40 percent or 38,000 megawatts of that hydroelectric capacity.

A recent report prepared by the National Energy Laboratories for the Department of Energy estimates that the undeveloped hydropower capacity in the U.S. is about 95,000 megawatts, of which approximately 22,000 is economically justifiable in light of the Electric Consumers Protection Act, dam safety considerations and current energy prices.

But even with that being the case, according to the same report, "This resource is not being developed because of the regulatory complexities and institutional and jurisdictional overlaps, the hydropower licensing process for a major facility requires 3 to 5 years. As a result, hydropower development is discouraged by increased project cost, increased uncertainty, lead time and decreased priority."

This committee is concerned not only with potential new hydropower development, but with the retention and use of existing facilities. Over the next 20 years, roughly 22,000 megawatts of in-

stalled hydro capacity will be coming up for relicensing. These older projects are going to be judged under standards which were not in effect when the projects were originally constructed. Some facilities may be removed, others may be downgraded.

As chairman of the subcommittee with jurisdiction over these matters, I am interested to learn how witnesses view this bill. I expect that certain provisions are likely to be controversial, especially those that propose to streamline the hydro licensing procedure and process.

I am well aware of the anecdotal evidence and occasional horror stories which indicate that the hydro licensing process could be made more efficient. I understand the frustration of businessmen and women whose investment opportunities have been burdened by redundant reporting requirements, unpredictable regulatory schemes, and inexplicable bureaucratic delay.

We need to bear in mind, however, that sighting hydroelectric facilities is not an everyday business activity like opening a fried chicken franchise. Most hydro facilities directly affect a number of public resources and public interests. Some facilities pose very substantial impacts to public values.

As we consider these sections of S. 341, the committee will be working hard to distinguish between those impediments to hydro licensing which are, on the one hand, the correctable absurdities of an old and much amended regulatory scheme and, on the other hand, the critical reviews which are genuinely needed to make sure that the public interest is fairly reflected in final licensing decisions.

I expect that all of us who serve on the committee hope to be able to use S. 341 to improve hydro licensing without streamlining the public interest out of the process. I think the bill is an enormously good one, and I look forward to the witnesses' comments.

[The text of subtitle C of title IV and section 10003 of title X follow:]

102D CONGRESS
1ST SESSION

S. 341

To reduce the Nation's dependence on imported oil, to provide for the energy security of the Nation and for other purposes.

IN THE SENATE OF THE UNITED STATES

FEBRUARY 5 (legislative day, JANUARY 3), 1991

Mr. JOHNSTON (for himself and Mr. WALLOP) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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A BILL

To reduce the Nation's dependence on imported oil, to provide for the energy security of the Nation and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be referred to as the "National Energy Security Act of 1991".

* * * * * * *

TITLE IV—RENEWABLE ENERGY

Subtitle C—Hydropower

SEC. 4201. SECTION 401 CERTIFICATION.—(a) STATE CERTIFICATION.—Any State or interstate water pollution control agency that receives a request for certification under section 401 of the Clean Water Act (33 U.S.C. 1341) in connection with an application for a license under part I of the Federal Power Act, as amended, (16 U.S.C. 791a et seq.) is prohibited from including as a condition of certification any requirement not needed to ensure that any discharge resulting from the issuance of such license, and the construction or operation of a hydroelectric project thereunder, will comply with the applicable provisions of 33 U.S.C. sections 1311, 1312, 1313, 1316 and 1317.

(b) VIOLATIONS.—Any requirement included in a certification which is determined by the Federal Energy Regulatory Commission to be in violation of subsection (a) shall not be effective.

SEC. 4202. STREAMLINING OF FEDERAL POWER ACT REGULATION.— The Federal Power Act, as amended, (16 U.S.C. 791a et seq.) is further amended by—

(a) striking in section 4(e) the following: ", and shall be subject to and contain such conditions as the Secretary of the department under whose supervision

such reservation falls shall deem necessary for the adequate protection and utilization of such reservation";

(b) inserting the following new subparagraph at the end of section 10(a)(2):

"(D) In the case of a project located within a reservation, the recommendations of the Secretary under whose supervision such reservation falls concerning the adequate protection and utilization of such reservation.";

(c) striking "and (B)" in section 10(a)(3) and inserting ", (B) and (D)" in lieu thereof;

(d) striking subsection (i) in section 10 and relettering the subsections accordingly;

(e) striking in section 18 the following: ", and such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate";

(f) adding at the end of section 23 the following: "(c) The provisions of this Act shall not apply to any project having a power production capacity of 1500 kilowatts or less.".

SEC. 4203. IMPROVEMENT AT EXISTING FEDERAL FACILITIES.—(a) The Secretary, in consultation with the Secretary of the Interior and the Secretary of the Army, shall perform studies of cost effective opportunities to in-

crease hydropower production at existing federally-owned or operated water regulation, storage and conveyance facilities. Such studies shall be completed within two years of the enactment of this Act and transmitted to the Committee on Energy and Natural Resources in the United States Senate and to the United States House of Representatives. An individual study shall be prepared for each of the Nation's principal river basins. Each such study shall identify and describe with specificity the following matters:

(1) opportunities to improve the efficiency of hydroelectric generation at such facilities through, but not limited to, mechanical, structural or operational changes;

(2) opportunities to improve the efficiency of the use of water supplied or regulated by Federal projects where such improvement could, in the absence of legal or administrative constraints, make additional water supplies available for hydroelectric generation or reduce project energy use;

(3) opportunities to create additional generating capacity at existing facilities through, but not limited to, the construction of additional generating units, the uprating of generators and turbines, and the construction of pumped storage facilities; and

(4) preliminary assessment of the costs of such measures.

(b) There is authorized to be appropriated in each of fiscal years 1992, 1993 and 1994 such sums as are necessary to carry out the purposes of this section.

* * * * * * *

TITLE X—NATURAL GAS

* * * * * * *

SEC. 10003. NEPA COMPLIANCE.

(a) LEAD AGENCY.—In cases where Federal Energy Regulatory Commission authorization of the construction or operation of facilities or projects under the Natural Gas Act

or the Federal Power Act may be deemed a major Federal action under the National Environmental Policy Act or requires the preparation of other environmental documents, the Commission shall be the lead agency and shall have primary authority for compliance with section 2 and title I of the National Environmental Policy Act. The Commission may set reasonable time limits for consultation with other Federal agencies which participate in the review of a proposed facility or project pursuant to the National Environmental Policy Act to complete their review of any potential environmental impacts of the construction or operation of such facility or project, and for such other agencies to consult and submit comments to the Commission.

(b) ENVIRONMENTAL DOCUMENTS.—Where environmental documents are prepared in connection with applications for authority to construct or operate facilities or projects under the Natural Gas Act or the Federal Power Act, the Federal Energy Regulatory Commission shall permit, at the election of the applicant, a contractor, consultant or other person funded by the applicant to prepare such environmental document. The contractor shall be chosen by the Commission in its sole discretion. The Commission shall establish procedures to assure that the contractor, consultant or other person has no financial or other potential conflict of interest in the outcome of the proceeding. Nothing herein shall affect

the Commission's responsibility to comply with the National Environmental Policy Act.

* * * * * * *

Senator BRADLEY. Senator Wallop.

STATEMENT OF HON. MALCOLM WALLOP, U.S. SENATOR FROM WYOMING

Senator WALLOP. Thank you, Mr. Chairman. I have a full written statement which I would ask to have inserted in the record. But let me just begin by saying no one can claim to be serious about energy policy and energy strategy and yet continue to burden American's access to their own claimed, environmentally sound, and efficient hydropower. For the most part, the hydropower provisions of this legislation address procedural difficulties such as multiple agency reviews and attempts by some States to expand their 401 certification beyond water quality. Those are useful, but they are not the entire solution.

This legislation would also require studies of the potential of increased generation at existing Federal facilities. That may be helpful, but what we really need is authorization and appropriations. Moreover, most of these studies already exist. For example, we do not need a new study of the Buffalo Bill project in my home State of Wyoming. We need to complete that project rather than engaging in ancillary considerations that are unrelated to the energy that would be produced by that.

Similarly, we do not need to study whether we could increase hydroelectric production through irrigation efficiencies. What we do need to do is to authorize and appropriate the moneys for the Secretary to pay for such efficiencies in a situation where water rights to the conserved water could be obtained under state law and could be used for generation provided that such improvements would be cost effective. And when non-federal power generation is involved, appropriate cost sharing should be entered into.

What I see happening, however, is another series of studies which will be picked apart, one by one, at some point in the future instead of producing power. There is the old Murphy's Law saying, the way to do nothing is to have a study. I also believe that the Federal Government should get along with the full development of its hydropower potential at existing facilities. If the Corps of Engineers and the Bureau of Reclamation are not going to develop these facilities, I think they should be open for private development.

A last point which I would like to make is that my interest in increased hydroelectric generation does not outweigh the role the States should play in the allocation and use of water. Senator Craig has reintroduced legislation to deal with Rock Creek and First Iowa. I think the committee needs to include that language in any legislation which would expedite FERC review.

Mr. Chairman, I look forward to hearing from the witnesses this afternoon.

[The prepared statement of Senator Wallop follows:]

PREPARED STATEMENT OF HON. MALCOLM WALLOP, U.S. SENATOR FROM WYOMING

Mr. Chairman, I am pleased that the Committee is holding today's hearing. Of all our sources of renewable energy, there is no source of power that is more environmentally benign than hydro. Yet no other type is fought against harder by the envi-

ronmental community, and for the life of me I do not understand why. Perhaps we will turn over some rocks today and find the reasons.

Several of the provisions the Committee is today considering address one key problem in getting hydroelectric projects built: state and federal agency abuse of the process.

One provision of the bill would prohibit states from misusing their Clean Water Act certificate authority to accomplish objectives not envisioned by that Act. Although every time they have been challenged in court they have lost, states continue to do so because the prospect of litigation causes many developers to knuckle under to state demands. They simply can not afford to fight. I strongly support this provision.

Another provision would remove the unlimited mandatory conditioning power of federal agencies, which they all too often employ to impose unwarranted or unrelated conditions on projects. I strongly support this provision also.

The bill would also turn over to state regulation small hydroelectric projects of 1.5 megawatts or less. While I support its direction, I do not believe that this provision goes far enough. Like the Administration, I believe that the mandatory Federal jurisdiction threshold should be set at 5 megawatts, but I would add a further provision which would make this optional with the developer.

The bill's requirement that the Secretary of Energy study the possibility of increasing hydroelectric power at federal facilities is woefully inadequate. Congress does not need another study that it won't read. There have been innumerable studies of Bureau of Reclamation facilities as well as Corps of Engineers. We do not need further studies or holding projects such as Buffalo Bill hostage to ancillary concerns. In addition, I believe that if the federal government isn't going to fully develop the hydroelectric potential of its facilities, then they should be opened up for private development.

I also want to make a comment about Federalism. The concept may be in some disrepute, but I think some of the problems which we have experienced in the licensing process and state reactions is a result of FERC failing to understand that, especially in the West, the control and jurisdiction over water belongs to the states, not the Federal government. Senator Craig has reintroduced legislation to reverse *1st Iowa* and the *Rock Creek* cases. I support that effort. If there is to be a preemption of state water law, for hydroelectric purposes or for other purposes, that preemption should be done by Congress on a site specific basis. Water is too precious for the judgment of agency bureaucrats to override the considered opinion of the states. Although I support the maximum development of hydroelectric potential, the decision as to beneficial uses of scarce water resources must be done by those most affected—the states.

Another provision of the bill would designate FERC as the lead agency for the purposes of NEPA compliance and allow it to set time limits for other Federal agencies. This too I strongly support.

In conclusion, let me say that while I believe that only environmentally responsible hydro projects should be built, all too often federal and state agencies, as well as others, have misused the process to block projects that they object to on philosophical grounds, not environmental reasons. The government should be the solution to our energy problems, not the cause.

If I may take an extra moment of everyone's time to recite just two of many "horror stories" given to me by the industry which illustrate the kind of problems we are trying to address with this bill.

Not too long ago the City of Eugene, Oregon proposed to install hydropower facilities at an existing Corps of Engineers dam on the Blue River. The Corps had already built the dam; the only thing that Eugene proposed to do was to install two generating units which would have had a modest—if any environmental impact. Pursuant to section 18 of the Federal Power Act, the National Marine Fisheries Service prescribed a fishway based on a facility at another dam. The Fisheries Service made no effort, in other words, to gear its design of the fishway to the Blue River dam. Moreover, according to the Federal Energy Regulatory Commission, the Fisheries Service offered no evidence that the prescribed fishway was needed, or that it would be effective, or even that it could be constructed. Indeed, again according to FERC, the Fisheries Service failed even to submit drawings or cost estimates. FERC Commissioner Trabandt characterized the Fisheries Service recommendation as simply an attempt to "cripple or kill" Eugene's proposed hydropower project. Nonetheless, because section 18 is mandatory, FERC was compelled to impose the Fisheries Service proposal on Eugene.

In another case involving licensing of the Island Park project in Idaho, the U.S. Forest Service and the Bureau of Reclamation each submitted mandatory conditions

to FERC pursuant to section 4(e) of the Federal Power Act. The respective Forest Service and Bureau conditions consisted of laundry lists of consultation and study requirements, with conflicting methodologies, subject matters, and schedules. These two federal agencies made no attempt to consult or coordinate with each other in order to agree on a single, integrated set of conditions. Because 4(e) is mandatory, according to the Supreme Court in the *Escondido* case, FERC was powerless to attempt to reconcile the competing and conflicting Forest Service and Bureau of Reclamation conditions, thereby leaving the licensee caught in between the two agencies. In this connection I must note that this project also encountered vociferous and protracted environmental opposition despite the fact that it was located at an existing dam and that Congress, by special law, specifically required that its construction have no significant impact on water quality; an extraordinary standard imposed on no other project in the United States.

These are but two examples, and I am not convinced that they are even the most egregious ones. It is precisely this kind of agency behavior that ought to be cured, and hopefully can be cured by this legislation.

Senator BRADLEY. Thank you very much, Senator Wallop.
Senator Craig.

STATEMENT OF HON. LARRY E. CRAIG, U.S. SENATOR FROM IDAHO

Senator CRAIG. Thank you very much, Mr. Chairman. Let me be very brief in associating myself with the remarks of my colleague from Wyoming and suggest just what he did in his closing statement that although there is certainly value in centralization for purposes of direction. There is also great difficulty in that when we try to reserve some of those things that we believe inherently are States' rights by nature of the Constitution and by historical authority. And as a result of that, S. 106 that I have introduced or been a co-sponsor of for the last several years, that would deal with Rock Creek and First Iowa.

I think it would be most appropriate to include this in section 4 of this legislation. Obviously in any national energy strategy, we need to recognize the role as we should of hydropower and its value as part of our energy mix. And I look forward to the comments of those who are before us today in testimony.

Thank you, Mr. Chairman.

Senator BRADLEY. Thank you very much, Senator Craig. Let us get on with our first panel. The first panel consists of Kevin A. Kelly, who is Director of Electricity, Coal, Nuclear, and Renewables at the DOE; the Honorable Dennis Underwood, Commissioner of the Bureau of Reclamation; Cynthia Marlette, Associate General Counsel for Hydroelectric and Electric at FERC; Dr. G. Edward Dickey, Acting Principal Deputy Assistant Secretary of the Army for Civil Works, Army Corps of Engineers; and Rolland A. Schmitten, Regional Director, Northwest Region, the Marine Fisheries Service, National Oceanic and Atmospheric Administration, Department of Commerce. That is a long title, Mr. Schmitten.

Let me welcome you all to the committee today. And we welcome your testimony. We would like to move along as quickly as we can, so if you could kind of give us a quick picture in about 10 minutes each. If you could do it shorter, that might even be better if it is done well. And then we will get to questions because I am sure members of the committee would like to ask questions. Let us begin with Mr. Kelly and then Mr. Underwood, Ms. Marlette, Dr. Dickey, and Mr. Schmitten.

STATEMENT OF KEVIN A. KELLY, DIRECTOR OF ELECTRICITY, COAL, NUCLEAR, AND RENEWABLES POLICY, OFFICE OF POLICY, PLANNING AND ANALYSIS, DEPARTMENT OF ENERGY, ACCOMPANIED BY PAUL CARRIER, SENIOR POLICY ANALYST

Mr. KELLY. Thank you, Mr. Chairman and members of the committee. I am Kevin Kelly, Director of the Office of Electricity, Coal, Nuclear, and Renewables Policy at DOE. Accompanying me today is Mr. Paul Carrier, a Senior Policy Analyst in my office who has over 18 years experience in the technical aspects of hydropower and its regulation.

Mr. Chairman, I am pleased to have the opportunity to present testimony concerning S. 341, the National Energy Security Act of 1991. With specific reference to those provisions regarding hydropower, the Department of Energy shares your concern——

Senator BRADLEY. Mr. Kelly, could you bring the microphone a little close to your mouth?

Mr. KELLY. The Department of Energy shares your concern that use of this valuable resource representing some 13 percent of the Nation's electricity capacity, is being impeded by conflicting and overlapping regulatory requirements. Hydropower has many advantages and we could have more of it. There are too many cooks without a head chef, and these cooks cannot always agree on what a hydropower developer has to do to satisfy environmental and other concerns.

FERC procedures are part of the problem. FERC usually does not say what studies to do until after the studies are done and the license application is filed.

The result is a licensing process that takes too long and costs too much and it does not give any more environmental protection than a more efficient process would. It discourages developers of good and bad projects alike. No one agency has the authority to discipline the process. Various Federal and State agencies can each set strict license conditions based upon its own agency mission such as protecting fish or preserving water quality without balancing these good objectives against other good objectives that can be achieved with more liberal license conditions. Onerous licensing procedures discourage cost-effective efficiency improvements between licensing hearings, which are up to 50 years apart.

The NES, or National Energy Strategy, calls for turning this situation around. While differing in some aspects, S. 341 and the National Energy Strategy are in basic agreement on the goals of simplifying the regulatory process and encouraging responsible development of this large and under-utilized renewable resource.

Specifically the NES proposes five things. One, amending the Federal Power Act to require each applicant for a license to consult with each affected agency to establish a study plan to be approved up front by the FERC and once approved, the plan may be modified only if there would be an affect on the public interest.

Two, amending the Federal Power Act to require FERC to coordinate a single, consolidated review of each license application for a non-Federal project by interested Federal and State agencies and affected Indian tribes. The agencies would use the results of this consolidated review in determining appropriate license terms and

conditions. FERC would be able to establish time limits for submissions of recommendations and reports by other agencies. This will eliminate multiple project reviews. In addition, license conditions must be supported by the results of the consolidated review.

NEPA review completed by FERC as part of this consolidated review would satisfy the requirements of NEPA for all agencies having regulatory authority for the project. FERC's actions would remain subject to judicial review for compliance with NEPA. These provisions apply to projects at both new and existing dams.

Number three, for hydropower projects at existing dams only, the NES proposes amending the Federal Power Act to give deference to the FERC license to the extent that other Federal or State actions are inconsistent with the license. In addition, FERC would have exclusive authority to determine which recommendations, terms and conditions would be included in a license for a project at an existing dam.

Number four, amending the Federal Power Act to remove FERC authority over all unlicensed projects of 5 megawatts or less. Existing licensees of projects of 5 megawatts or less may elect to be deregulated by applying to FERC to surrender their licenses. The requirements of section 401 of the Clean Water Act would still apply to these projects over which FERC would no longer have authority.

And number five, the NES proposes asking all licensees of older projects to evaluate the potential for efficiency improvements, and FERC would seek to expedite approval of applications to make these improvements.

The NES objectives are very similar to those of the Senate bill. I would mention very briefly the following six areas of difference, not conflict, between our NES proposals and those contained in S. 341.

First, the Senate bill lets FERC determine if a water quality certification sets conditions that exceed its proper domain, and does so for all licensees. The NES, in contrast, lets the FERC exclude water quality conditions determine if a water quality certification imposes conditions that do not properly balance all interests. But FERC can do this only for projects at existing dams.

Second difference, S. 341 lets FERC be the only Federal agency that can impose mandatory license conditions. The NES would do this only for projects at existing dams.

Third difference, S. 341 would deregulate projects less than 1.5 megawatts. The NES would do this for projects less than 5 megawatts. And where the NES sets a policy for current small project licensees and for 401 certification, the Senate bill is silent on these policies.

Fourth difference, S. 341 does not explicitly urge studies of upgrades at currently licensed non-Federal projects. The NES does.

But, number five, S. 341 does ask for studies of upgrades at Federal projects. The NES would do this through administrative action.

Finally, six, the NES calls for FERC to pre-approve a consolidated study plan and have a consolidated project review. And we recommend including this provision in S. 341.

To conclude, Mr. Chairman, taken as a whole, the regulatory reforms proposed in S. 341 are quite consistent with the administra-

tion's proposals in the NES. Enactment of these provisions modified as I have suggested, together with the additional complimentary provisions recommended in the NES, will help insure the expeditious, responsible development and utilization of the Nation's hydropower resources.

Mr. Chairman, I appreciate the opportunity to testify on S. 341 and would be pleased to answer any questions.

Thank you.

[The prepared statement of Mr. Kelly follows:]

PERPARED STATEMENT OF KEVIN A. KELLY, DIRECTOR OF ELECTRICITY, COAL, NUCLEAR, AND RENEWABLES POLICY, OFFICE OF POLICY, PLANNING AND ANALYSIS, DEPARTMENT OF ENERGY

Mr. Chairman and members of the committee, I am pleased to have the opportunity to present testimony concerning S. 341, The National Energy Security Act of 1991, with specific reference to those provisions regarding hydropower. The Department of Energy shares your concern that use of this valuable resource—representing 13 percent of the Nation's electricity capacity—is being impeded by conflicting and overlapping regulatory requirements.

Hydropower has many advantages. In addition to offering a large and secure indigenous renewable energy resource which produces no atmospheric emissions or toxic wastes, hydropower provides utilities with the ability to respond quickly to variations in load demand with very low operating costs. In addition to electrical energy, hydropower facilities can also offer other valuable benefits to their neighboring communities, such as flood control, irrigation, navigation, employment, water supply, and recreation. According to the Federal Energy Regulatory Commission (FERC), hydropower is currently providing about 90,000 of generating capacity, including 17,000 MW of pumped storage. The potential for additional cost-effective development is significant, even if restricted to adding capacity at existing dams and making efficiency improvements in existing facilities. Based on analysis done for the National Energy Strategy (NES), we project that an additional 16,000 MW could be economically developed if the regulatory process is streamlined.

As a result of recent legislation, court decisions, and FERC regulations, the licensing process for non-Federal hydropower projects has become complex and decentralized. Although FERC remains the primary regulator of non-Federal hydropower projects, many other Federal and State agencies can mandate license conditions or issue separate permits that may conflict with or nullify FERC licensing decisions. These agencies conduct multiple environmental reviews leading to overlapping regulatory processes, conflicting license and permitting requirements, and disagreements over environmental study and mitigation requirements. FERC itself contributes to licensing delays by not routinely identifying the studies necessary to evaluate a project until after the application is filed.

The result of these multiple and conflicting requirements is a lengthy and expensive regulatory process that takes 5 to 10 years or more to complete. Prospective hydropower developers are discouraged by the cost and the length of time necessary to acquire regulatory approvals, and by the risks of lost investments if any of the many required permits are denied. Many of those who initiate the regulatory process are unable to complete regulatory review successfully and build a hydropower project.

Among the major obstacles to non-Federal hydropower development are:

No single agency, of the many involved in hydropower regulation, is able to discipline the process. No agreement exists among Federal and State licensing agencies as to the scope of studies requested. The process for resolving differences among developers, intervenors, and regulatory authorities is unpredictable, which works against investment planning.

Federal and State agencies that now set mandatory license conditions or issue separate permits or certificates may have single purpose statutory missions such as the protection of fish or water quality. As a result, the current process that separates environmental considerations from other factors is inefficient.

The cost of mitigating environmental impacts may not equal the environmental benefits derived from the investment. Benefit/cost data for environmental mitigation are qualitatively derived and subject to interpretation by parties intervening in the licensing process.

FERC does not have a program of encouraging efficiency improvements at licensed projects until the project license is due for renewal, 50 years after it is issued.

To address these obstacles, DOE convened an interagency working group to develop hydropower initiatives for the National Energy Strategy.

We had previously announced a hydropower initiative, in January 1990, to review the licensing/relicensing process to see how it might be streamlined without sacrificing environmental stewardship, and to develop the information necessary for objective decisions about environmental studies and mitigation. To that end, we initiated research to evaluate the costs, benefits, and effectiveness of environmental mitigation practices required for hydropower development. To date, we have collected such data from over 200 hydropower projects for analysis. This study will be completed by the end of the fiscal year. It will also provide guidance for further work on development of evaluation criteria and methodologies designed to compare societal and environmental costs and benefits of hydropower projects.

While differing in some details, S. 341 and the National Energy Strategy (NES) are in basic agreement on the goal of simplifying the regulatory process and encouraging the responsible development of this large and underutilized renewable resource.

Specifically, the NES proposes:

1. Amending the FPA to require each applicant for a license to consult with all affected agencies to establish a study plan to be approved by FERC. Once approved, the plan may be modified only for good cause. This will encourage FERC and agencies to identify all necessary studies at an early stage and would protect applicants from unexpected, last-minute and time-consuming studies.

2. Amending the FPA to require FERC to coordinate a single, consolidated review by interested Federal and State agencies and affected Indian tribes of each license application for non-Federal projects and utilizing the results of this consolidated review in determining appropriate license terms and conditions. A National Environmental Policy Act (NEPA) review completed by FERC as part of this consolidated review shall satisfy the requirements of NEPA for all agencies having regulatory authority for the subject project. FERC's actions would remain subject to judicial review for compliance with NEPA. Also, FERC may establish time limits for submission of recommendations and reports by other agencies. This will eliminate multiple project reviews. In addition, license conditions must be supported by the results of the consolidated review.

3. Amending the Federal Power Act (FPA) for hydropower projects at existing dams or conduits to give deference to the FERC license to the extent that other Federal or State actions are inconsistent with the license. In addition, FERC would have exclusive authority to determine which recommendations, terms, conditions, and prescriptions will be included in a license for a project at an existing dam. This will curtail delay and uncertainty in the licensing process for projects at existing dams.

4. Amending the FPA to remove FERC authority over all unlicensed projects with an installed capacity of 5 megawatts or less. Existing licensees of projects of 5 megawatts or less may elect to be deregulated by FERC by surrendering their licenses. The requirements of Section 401 of the Clean Water Act still apply to all projects over which FERC would no longer have authority. This will encourage hydropower development by reducing the regulatory burden on small projects and freeing FERC resources. Small projects have little or no impact on navigation or interstate commerce, which is the primary justification for FERC jurisdiction.

5. Asking all licensees of older hydropower projects to evaluate the potential for efficiency improvements. FERC would seek to expedite approval of applications to make these improvements.

I would mention the following areas of difference—not conflict—between our NES proposals and those contained in S. 341:

1. Section 4201 limits the scope of Section 401 water quality certifications to the effect on water quality of discharges resulting from the issuance of a hydropower license and the construction or operation of the project, and permits FERC to determine if a State-imposed requirement in a water quality certification is proper. This provision is compatible with the NES proposals. For a project at an existing dam, the NES provides that the terms of a license prevail over either a water quality certification that is in conflict with the license or a denial of certification. The NES proposes that small projects no longer regulated by FERC will still remain subject to Section 401 water quality certification.

2. Section 4202 removes the authority for Federal agencies other than FERC to impose mandatory conditions on projects, but permits a Secretary under whose supervision a reservation falls to make recommendations. These are similar provisions to those contained in the NES. However, the NES proposes that FERC be given this exclusive authority only for projects at existing dams because these projects are less controversial and have minimal environmental impacts.

3. Section 4202 also exempts projects of 1.5 megawatts or less from FERC jurisdiction. We prefer the 5 megawatt limit proposed in the NES because of the limited impact of these projects on issues related to FERC's jurisdictional authority. Further, S. 341 does not provide for the disposition of small projects that are currently licensed or indicate whether these projects will remain subject to Section 401 water quality certification per proposed section 4201. These issues should be clarified.

4. Although we believe FERC can implement a program to encourage efficiency improvements at licensed projects, it may be appropriate to include a requirement for such a program in Section 4203.

5. Section 4203 authorizes the Secretary of Energy, in consultation with other agencies, to perform studies of cost-effective opportunities to increase hydropower production at existing Federally owned or operated projects. We support this provision.

6. Missing from S. 341 are provisions requiring FERC approval of study plans and a consolidated project review. For reasons stated earlier, we recommend that these provisions of the NES be included in S. 341.

Taken as a whole, the regulatory reforms proposed in S. 341 are quite consistent with the Administration's proposals in the NES and with our ongoing and planned work program. Enactment of these provisions, modified as I have suggested, together with the additional complementary provisions recommended in the NES, will help ensure the expedious responsible development and utilization of the Nation's hydropower resources.

Mr. Chairman, I appreciate the opportunity to testify on S. 341 and would be pleased to answer any questions.

Thank you very much.

Senator BRADLEY. Mr. Underwood.

STATEMENT OF HON. DENNIS B. UNDERWOOD, COMMISSIONER, BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR

Mr. UNDERWOOD. Thank you, Mr. Chairman.

I am here today representing the Department of the Interior. I would like to request that my written statement be made a part of the record.

Senator BRADLEY. Without objection, so ordered.

Mr. UNDERWOOD. What I would do is just highlight some of the points that I have in my statement.

The Bureau of Reclamation is one of the Nation's major producers of hydroelectric power. Generation of hydroelectric power is one of the key purposes for the Reclamation projects. In terms of capacity, we are the 11th-largest electric utility in the United States. We operate 52 hydroelectric power plants in the western United States with an installed capacity of nearly 14,000 megawatts.

We would like to just point out some of the advantages of hydroelectric power. Some of those are very obvious: high level of mechanical reliability, low operating costs relative to other energy sources, ability to easily adjust to load changes, and does not produce waste products.

However, there are adverse environmental impacts relative to hydroelectric power generation. And those are generally related to in-stream uses.

I think one of the keys to not only reclamation, but also any hydroelectric power generator is to increase the compatibility of existing and new hydroelectric power developments with the environment while ensuring hydroelectric power contributions to meeting the Nation's energy needs.

How can we assist—Reclamation and others assist—in meeting our national energy needs with hydroelectric power? I think one of the key ingredients is improve efficiency and reliability of generating hydroelectric power plants to increase capacity and energy.

Another point is to improve water and energy conservation. They are closely related and provide more effective use of energy and the reduction in peak needs.

Third, I think another important part is continued research and development and transfer technology relative to opportunities to improve hydroelectric power generation, energy storage, reduce operation and maintenance cost, and improve the environmental compatibility of hydroelectric generation.

And fourth is through—either through the non-Federal development or non-Federal financing—additional conventional hydroelectric generation, pump storage, low head hydroelectric power plants, and other renewable energy technologies and energy storage systems, where economically justified and environmentally acceptable.

Going back to that first point, Mr. Chairman, when I was making reference to improve efficiency, one of the items that the bureau has undertaken for some time is its generator uprating program. The average age of our generators are about 37 years. Power plants—again, we have 52 at about 190 units. Following the 1973 oil embargo, Reclamation reviewed its facilities to determine if there were technical and economical feasibility of uprating existing power plants to increase energy and capacity.

Based on a 1977 report by Reclamation, relative to a Western Energy expansion study, it concluded uprating of existing units was a most immediate and cost-effective environmentally acceptable means to contribute to meeting the Nation's energy needs.

As of January 1 of this year, our generator uprates have been completed on 36 units, for an increase in the capacity of over 1,100 megawatts. An additional 30 generating units have been identified as potential candidates for uprating, and the President's 1992 budget request for Reclamation proposes expenditures of $35 million, including $25 million from non-Federal or revenue finance sources to continue the uprating program.

With that, Mr. Chairman, that concludes my remarks. And I think you for the opportunity to testify here.

[The prepared statement of Mr. Underwood follows:]

PREPARED STATEMENT OF DENNIS B. UNDERWOOD, COMMISSIONER, BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR

Thank you Mr. Chairman. I appreciate the opportunity to appear before you as the representative of the Department of the Interior to offer testimony regarding S. 341, the proposed "National Energy Security Act of 1991," introduced on February 5, 1991, by Senator Johnston and Senator Wallop.

In his letter of February 13, 1991, advising Secretary of the Interior Lujan of today's hearing, Chairman Johnston specifically requested comments on Title IV of the bill concerning provisions pertaining to hydroelectric power licensing and efficiency, and section 10003, compliance with the National Environmental Policy Act.

With respect to the Administration's comments on S. 341, I will defer to the views of the Department of Energy.

The Bureau of Reclamation (Reclamation) is one of the Nation's major producers of hydroelectric power. When compared with all of the nation's electric utilities, not just the producers of hydroelectric power, Reclamation ranks as the 11th largest in terms of capacity. Currently Reclamation operates 52 hydroelectric powerplants in the western United States with an installed capacity of nearly 14,000 megawatts (MW) or about 16 percent of the Nation's hydroelectric power capacity. Annually, Reclamation's hydroelectric powerplants generate an average of 60 billion kilowatt hours.

Uprating of existing facilities could provide more energy or capacity. In addition, hydroelectric power enjoys several advantages over most other sources of electrical power. These include a high level of mechanical reliability, low operating costs, and the ability to easily adjust to load changes. Also, hydroelectric power does not produce waste products that contribute to air quality problems, acid rain, or greenhouse gases, nor does it require the activities associated with the mining, processing, and transport of fossil fuels.

This is not to say that hydroelectric power facilities do not have adverse environmental impacts. However, with careful planning and appropriate consideration of operational constraints, these impacts can be minimized in a manner which balances the Nation's interests in its energy future with the protection of its environmental resources. A key challenge for Reclamation, as well as other producers of hydroelectric power, will be to increase the compatibility of existing and new hydroelectric power developments with the environment while ensuring hydroelectric power's contribution to meeting the Nation's energy needs.

Reclamation stands ready to assist in meeting the Nation's energy needs. We have identified four ways in which Reclamation can do this:

1. By improving the efficiency and reliability of our hydroelectric powerplants in order to increase the capacity and energy which they provide,

2. By improving water and energy conservation at Reclamation projects,

3. By continuing research and development, and technology transfer, opportunities to improve hydroelectric generation technology, reduce operation and maintenance costs, and improve the environmental compatibility of hydroelectric power generation, and

4. By allowing construction by non-Federal entities of new powerplants at existing dams where they are economically justified and environmentally acceptable.

Following the 1973 oil embargo, Reclamation initiated a review of existing Reclamation hydroelectric power facilities to determine the technical and economic feasibility of uprating existing powerplants for the production of additional energy or the provision of additional capacity. This led to the publication in 1977 of Reclamation's *Western Energy Expansion Study*, which concluded that the uprating of existing units was the most immediate, cost effective, and environmentally acceptable means for Reclamation to contribute to meeting the Nation's energy needs.

Following the study, Reclamation began implementation of a generator uprating program. As of January 1 of this year, generator uprates have been completed on 36 units for an increase in capacity of over 1,100 megawatts. An additional 30 generator units have been identified as potential candidates for upratings. These units, which have the potential to provide over 450 megawatts of additional capacity will be considered in future budgets, following evaluation of economic, environmental, and power marketing aspects. The President's budget request for fiscal year 1992 proposes the expenditure of $35 million, including $25 million from non-Federal or revenue financed sources, to continue the uprating program.

In addition to our uprating program, we have already compiled information on opportunities to add hydropower production in the western states. Starting with our 1977 *Western Energy Expansion Study Report*, we have published a series of studies on hydroelectric power opportunities at our projects and at other potential sites.

As you know, the Administration released its *National Energy Strategy* last week. Portions of that report speak to the role of hydroelectric power in meeting the Nation's future energy needs.

The Administration will be submitting legislation to streamline the Federal Energy Regulatory Commission by making it part of the Executive Branch and authorizing it to coordinate a single, comprehensive, combined State and Federal agency review of hydroelectric power projects.

Mr. Chairman, that concludes my remarks. Thank you for the opportunity to testify.

Senator BRADLEY. Thank you very much, Mr. Underwood.
Ms. Marlette.

STATEMENT OF CYNTHIA A. MARLETTE, ASSOCIATE GENERAL COUNSEL, HYDROELECTRIC AND ELECTRIC, FEDERAL ENERGY REGULATORY COMMISSION

Ms. MARLETTE. Mr. Chairman, members of the committee, thank you for the opportunity to speak to you about the hydro portions of S. 341. I appear here today as a staff witness and I do not represent members of the FERC.

The current statutory and regulatory licensing scheme is a very cumbersome one. It can often result in the delay or defeat of valuable hydroelectric development. S. 341 would help to adjust the statutory scheme by giving the Commission additional authority to determine what conditions are contained within a license and to also make the Commission the lead agency for NEPA purposes.

I offer in my prepared testimony some proposed provisions which would, in addition to the provisions in S. 341, further facilitate the review and authorization of hydrocapacity, while at the same time fully protecting environmental and other non-developmental considerations.

First, S. 341 would help the Commission to resolve potential conflicts only regarding conditions contained within a license. The committee may want to consider further reform which would take into account not only potential conflicts regarding conditions within a license, but conflicts between a FERC license and regulatory authorizations by other agencies—in other words, other regulatory requirements external to the license itself.

If Congress wishes to break the regulatory gridlock that has delayed or defeated projects in the past few years, it may want to consider legislation that provides that in the event of a conflict between a FERC license and the terms of other Federal or State authorizations with respect to the same project, the terms of the license would prevail.

Further, if a project has been issued a Commission license but has been denied other Federal or State authorization for the same project, the licensee of the project would be able to proceed under the license alone.

This type of provision, in conjunction with the section—with the S. 341 provision concerning section 401 Clean Water Certification, would allow States to prevent a project based on a valid denial of a water-quality certification. But it would not allow States or other Federal agencies to deny other types of authorization in order to defeat a project.

In so far as terms and conditions of a license are concerned, States could attach water quality conditions which are, indeed, related to water quality. As to terms and conditions included by States and other Federal agencies in other types of authorizations, those would not be able to conflict with the terms of the license.

Second, we would further recommend a somewhat more detailed provision regarding NEPA compliance, in order to ensure a centralized, effective review process. We propose that the committee consider a provision that gives the Commission not only the au-

thority to establish reasonable deadlines concerning consultation and comments, but also reasonable deadlines to submit recommended terms, conditions, prescriptions, reports, and so forth, by State and Federal agencies, Indian tribes—any party affected and interested in the license.

We would also propose the ability to continue processing a licensing application if interested parties do not meet the prescribed deadlines. This proposal would also specify that the Commission's NEPA document would be the only documentation needed to satisfy NEPA requirements by an agency which is involved in the application process for the project subject to the review.

My specific recommendations are contained in the written testimony. And other technical comments are also provided.

I thank you for the opportunity to be here and would be happy to try to answer any of your questions.

Thank you.

[The prepared statement of Ms. Marlette follows:]

PREPARED STATEMENT OF CYNTHIA A. MARLETTE, ASSOCIATE GENERAL COUNSEL, HYDROELECTRIC AND ELECTRIC, FEDERAL ENERGY REGULATORY COMMISSION

Mr. Chairman and members of the committee, I am pleased to be here this afternoon to discuss the hydropower licensing provisions of S. 341, the National Energy Security Act of 1991.

My name is Cynthia Marlette, and I am Associate General Counsel for Hydroelectric and Electric at the Commission. I am appearing before you as a staff witness and do not speak for the members of the Commission.

S. 341 has two sections dealing specifically with the licensing of non-Federal hydroelectric projects. These sections, which give the Commission additional authority to determine what conditions it believes belong in the licenses it issues, should generally help streamline the hydropower licensing process. In addition, we have several suggestions to these proposals that will further facilitate the review and authorization of hydroelectric capacity.

Section 4201: Water Quality Certification

Section 4201 of S. 341 addresses the conditions that may be attached to a water quality certification issued pursuant to Section 401 of the Clean Water Act for a hydroelectric project proposed to be licensed under the Federal Power Act. Water quality certification, or waiver thereof, is a prerequisite to issuance of a Federal Power Act license, and the certification is by law a condition of such license. Section 4201 of S. 341 prohibits a certifying agency from conditioning a certification with any requirement not needed to ensure project compliance with "the applicable provisions of" the water quality standards set forth in the Clean Water Act. Any certification requirement that the FERC determines violates this prohibition shall not be effective.

Section 4201 would codify what we believe to be the meaning and intent of the Clean Water Act, and what state court decisions reviewing certifications confirm: that conditions attached to water quality certifications are to deal only with water quality. Certification is not to be used as a parallel licensing proceeding in which the certifying agency usurps the Commission's exclusive authority to balance all the beneficial uses of a waterway in the public interest.

Section 4202: Sections 4(e) and 18 of the FPA

Section 4202 of S. 341 deletes from Section 4(e) of the Federal Power Act the provision that imposes, on any license issued for a project that would occupy part of a federal reservation, such conditions as the Department Secretary supervising such reservation shall deem necessary for its adequate protection and utilization. In lieu of the Secretary's authority to impose mandatory conditions, the bill provides, in an amendment to Section 10(a) of the Act, that the Commission shall consider the Secretary's recommendations for license conditions on behalf of the reservation.

Section 4202 also deletes from Section 18 of the Act the authority of the Secretary of the Interior or the Secretary of Commerce, as appropriate, to prescribe mandatory fishways at licensed projects.

These amendments should expedite the review process without undermining environmental protection. By allowing other agencies to impose mandatory conditions on the Commission's licenses, existing law creates the potential for agency conditions that are inconsistent with the Commission's own conditions, or that are so burdensome as to render infeasible a project that the Commission determined was in the overall public interest. Furthermore, a number of licensing proceedings have been subjected to substantial delay while an agency develops its mandatory conditions. Also, the Commission could be placed in the anomalous position of defending on judicial review and enforcing a condition that it did not promulgate and with which it may not even agree.

Under this proposal, the Commission's adoption, revision, or rejection of agency-recommended license conditions must be supported by substantial evidence and is subject to judicial review. In our view, the benefit of converting the proposed license conditions of other agencies from mandatory to recommended is that this will centralize in one agency—the agency charged by Section 10(a) of the Federal Power Act with balancing all aspects of the public interest—the authority to condition a license in a manner consistent with the balancing of developmental and environmental issues, as the FPA contemplates.

The Committee may want to consider some further changes to Section 4202 that would provide additional reform to the regulatory process with respect to hydroelectric development. These changes would be consistent with the basic thrust of proposed Section 4202, and would take into account not only the potential conflicts within the license but also potential conflicts between the license and other regulatory requirements. Attached to my testimony (Enclosure A) is a proposed FPA Section 4(h), which provides that, if there is a conflict between the terms of an issued Commission license and the terms of any other federal or state authorization with respect to the same project, the terms of the license prevail; and if such federal or state authorization is denied, the project may proceed under the issued license alone. If the Congress wishes to break the regulatory gridlock that has defeated or delayed hydroelectric project proposals in the last several years, we believe this proposal merits serious consideration.

Section 4202: Deregulation of Projects 1.5 MW and Under

Section 4202 of S. 341 provides that Part I of the Federal Power Act shall not apply to any project having a power production capacity of 1500 kilowatts (1.5 megawatts) or less. Accordingly, the bill also deletes Section 10(i) of the Act, which gave the Commission certain waiver authority with respect to projects of 1500 kilowatts or less installed capacity. We note that Section 4202 will also remove the Commission's authority under Section 30 of the Act to issue exemptions from Part I of the Federal Power Act to 1500-kilowatt conduit hydroelectric facilities, and its authority under Section 405 of the Public Utility Regulatory Policies Act to issue such exemptions for 1500-kilowatt hydroelectric projects at existing dams.

Section 4202 is another step in the right direction. In most cases, projects with an installed capacity of 1500 kilowatts or less have only a minor effect on interstate interests. Furthermore, any such projects located on public lands and reservations of the United States will remain subject to the authority of the federal agency administering those lands and reservations.

There is, however, one concern with the way Section 4202 is worded. The Federal Power Act (at Section 3(11)) defines "project" in terms of a complete unit of development, meaning all the structures, facilities, water rights, and lands which are used in connection with such unit. While the complete unit of development must be licensed, the Commission is not required to place all parts of the unit under a single license. For ownership or other reasons, the Commission has sometimes licensed different parts of a unit of development in different licenses. Conversely, on occasion the Commission has placed more than one unit of development in a single license. Therefore, the installed capacity ascribed to a license does not necessarily correspond to the installed capacity of a "project" as defined by the Act.

Even more significant, however, is the fact that the Commission's hydropower data base does not define projects in terms of complete units of development. Instead, the data base identifies what may be called "plants." Generally, a plant refers to a dam and the associated powerhouse. Of the 1384 hydroelectric plants currently under license, 425 plants—31 percent—are 1500 kilowatts or less. Of the 692 plants currently under exemption, 544 plants—79 percent—are 1500 kilowatts or less. Of the combined total of 2076 plants under license or exemption, 739—36 percent—are 1500 kilowatts or less.

On a river with many hydroelectric plants, all the plants on that river could arguably constitute a single unit of development, to the extent their operations are hy-

draulically interdependent. Thus, if deregulation is intended to be based on "projects" as defined in the Federal Power Act, identifying the affected facilities could in many cases be a complex and contentious undertaking. On the other hand, if deregulation were to be based on the installed capacity of each "plant," the result could be that, on a river with many hydroelectric plants, all of which might be a single unit of development, the Commission might have jurisdiction over some, but not all, of the plants. This result would obviously complicate comprehensive regulation of the river basin. Before we can suggest an appropriate definition of "project" for purposes of deregulation, we will need clarification of the legislators' intent in this regard.

Finally, I note that, if Congress removes from the provisions of the Federal Power Act small projects proposed to be located on navigable waters of the United States, these proposed projects would appear to be subject to the provisions of Sections 9 and 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §§ 401 & 403), which require the consent of Congress for the construction of dams or other obstructions to navigable capacity. The Federal Power Act did not repeal the 1899 Act as to hydropower projects; rather, it delegated to the Commission the authority to license hydropower projects on navigable waters.

Section 10003(a): NEPA Compliance

Section 10003(a) of S. 341 provides that the Commission shall be the lead agency for purposes of the National Environmental Policy Act in processing applications to construct or operate facilities or projects under the Natural Gas Act or the Federal Power Act. The bill provides that the Commission may set reasonable time limits for other agencies participating in the review of such proposal to consult and submit comments to the Commission.

The thrust of this section of S. 341 generally reflects the current state of the law. However, insofar as the hydropower licensing program is concerned, we recommend the Committee consider a somewhat more detailed provision that will go further to ensure an effective centralized review process. Attached to my testimony (Enclosure B) is a proposed FPA Section 4(i), which designates the Commission as lead agency for NEPA purposes for the project subject to the review, and specifies that the Commission's NEPA document satisfies the NEPA responsibilities of any other agency participating in the application review.

This additional proposal also empowers the Commission to establish reasonable deadlines not only for consultation and the submittal of "comments," but also for the submittal by federal agencies, state agencies, affected Indian tribes, and other interested persons of comments, recommendations, terms, conditions, prescriptions, and reports. It must be emphasized that this proposal does not seek to oust federal and state agencies from the NEPA process. Rather, this proposal states that, if an agency does not meet Commission-established deadlines, the Commission may continue to process and to take any appropriate action on the license application. Thus, a resource agency could not, for example, wait until the eleventh hour before deciding whether it needed additional environmental review before giving a necessary comment or recommendation. If the resource agency did appropriately meet FERC-established deadlines, then the review process would continue in the same manner as it currently operates. The purpose of this language is to ensure the Commission's ability to keep on track not only the NEPA review but also the timely participation of other federal and state agencies with regulatory roles in the licensing process.

Section 10003(b): Funding of Environmental Documents

Section 10003(b) of S. 341 provides that an applicant for authority to construct or operate facilities or projects under the Natural Gas Act or the Federal Power Act may elect to fund a contractor to prepare the environmental document required in connection with such application. The Commission shall choose the contractor and shall establish procedures to ensure that it has no financial or other potential conflict of interest in the outcome of the proceeding.

In its FY 1992 Congressional Budget Request, the Commission submitted proposed appropriation language that would empower it to charge applicants directly for environmental costs related to processing applications to construct or operate facilities and projects under the Natural Gas Act and the Federal Power Act. S. 341 and the Commission's proposal would accomplish the same basic goals. However, we continue to recommend authorization of direct billing authority, because it would provide more flexibility in funding the costs of the Commission's environmental review. Draft language for the Commission's proposal is attached to my testimony (Enclosure C).

Finally, we understand that the legislation to implement the National Energy Strategy will contain proposals on the hydroelectric licensing process. Several as-

pects of my testimony here may also apply to aspects of the NES proposals. However, the NES may contain additional proposals not addressed in S. 341. We would be pleased to come back before the Committee to comment on the hydropower part of the NES at the appropriate time.

This concludes my statement, Mr. Chairman. I would be happy to answer any questions you may have.

[Enclosure A]

Section 4(e) of the Federal Power Act (16 U.S.C. 797 et seq.) is amended by adding after subsection (g):

"(h) If there is a conflict between the terms of a license issued under this part for a hydropower project and the terms of a permit, right-of-way, license, certification, or other authorization required by another Federal agency or a State agency with respect to the same project, the terms of the license issued under this part prevail. If the hydropower project has been issued a license under this part and has been denied a permit, right-of-way, license, certification, or other authorization by another Federal agency or a State agency, the licensee of the project may proceed under the license issued under this part.".

[Enclosure B]

"In cases where Federal Energy Regulatory Commission authorization of the construction or operation of facilities or projects under the Natural Gas Act or the Federal Power Act may be deemed a major Federal action under the National Environmental Policy Act or requires the preparation of other environmental documents, the Commission shall be the lead agency and shall have primary authority for compliance with section 2 and title I of the National Environmental Policy Act. A review under the National Environmental Policy Act completed by the Commission is the only documentation needed by an agency to satisfy the requirements of the National Environmental Policy Act for the project subject to the review. The Commission may establish reasonable time limits for submission of comments, recommendations, terms, conditions, prescriptions, and reports by a Federal agency, State agency, Indian tribe, and other interested persons. If an agency does not meet the Commission's time limitations, the Commission may continue to process and to take any appropriate action on the application."

[Enclosure C]

"Notwithstanding any other provision of this or any other Act, the Federal Energy Regulatory Commission shall have the authority, by rule or order, to charge directly for environmental costs related to processing (a) applications filed under the Natural Gas Act for permission to construct and operate natural gas pipeline facilities and (b) applications filed under the Federal Power Act for hydroelectric licenses and relicenses; Provided further That amounts charged under this authority are in addition to amounts appropriated to FERC and shall not be used to reduce any such appropriation."

Senator BRADLEY. Thank you very much, Ms. Marlette.

Dr. Dickey.

STATEMENT OF DR. G. EDWARD DICKEY, ACTING PRINCIPAL DEPUTY ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS, DEPARTMENT OF THE ARMY

Dr. DICKEY. Mr. Chairman, members of the committee, I am pleased to be here this afternoon and will briefly summarize my statement and ask that my full statement be included in the record.

I will first briefly discuss the role of the Army Corps of Engineers in developing the Nation's hydroelectric power supply. I will also briefly summarize the Corps' involvement in hydropower development and production, and the policies under which we provide for new development.

Through various statutes, beginning with the Flood Control Act of 1938, Congress has directed the Corps to take into account the potential for hydroelectric power development in developing new water resources projects. On the basis of these plans, Congress has authorized numerous projects that involve hydroelectric power development.

Hydroelectric power produced at Corps facilities accounts for 27 percent of the Nation's total hydropower production. The Corps is the single-largest producer of hydroelectric energy in this country. The Corps operates 75 hydropower projects, and has approximately 21,000 megawatts of production capacity. This is 3 percent of all electric power generated.

In the Water Resources Development Act of 1976, Congress authorized the Corps of Engineers to conduct a national hydropower resources study. This study examined the potential for additional hydroelectric power at both Federal and non-Federal sites. This study was completed in 1983 and later updated.

The 1988 update contains information about the status of hydropower at over 350 Corps dams. This technical information has been shared with and is being used by State and local governments, as well as private industry, and would be of value to the Secretary of Energy in undertaking the study proposed in section 4203 of S. 341.

We support the development of economically-feasible, environmentally-sound hydropower projects. Moreover, it is our policy to encourage non-Federal development of the hydropower potential where it is practical.

At existing Corps projects, non-Federal development is approved through the Federal Energy Regulatory Commission's licensing procedures. Before 1987, non-Federal interests constructed 38 power plants at Corps facilities. Today there are 63, an increase of 60 percent in just 4 years. In addition, there are currently 10 projects under active construction and 46 licensed projects in design stages.

Where non-Federal development is impractical—and generally, this is at existing Federal power houses or where Federal development has been authorized by Congress—it is our policy to develop power with non-Federal financing.

Under this policy, we have recently completed power addition at our Town Bluff, Texas project, and are proceeding with the addition of new facilities to the power house at Fort Gibson Lake, Oklahoma.

Mr. Chairman, this concludes my statement. I will be happy to answer your questions.

[The prepared statement of Dr. Dickey follows:]

PREPARED STATEMENT OF DR. G. EDWARD DICKEY, ACTING PRINCIPAL DEPUTY ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS, DEPARTMENT OF THE ARMY

INTRODUCTION

Mr. Chairman and Members of the Committee, I am G. Edward Dickey, Acting Principal Deputy Assistant of the Army (Civil Works). I am pleased to be here this afternoon.

S. 341, THE NATIONAL ENERGY SECURITY ACT

As I understand, the purpose of this hearing is to discuss S. 341, the National Energy Security Act of 1991. I will defer to the Department of Energy to present the Administration position on the provisions of S. 341.

ROLE OF THE CORPS OF ENGINEERS

I would like to take this opportunity to discuss the Army Corps of Engineers role in developing the Nation's hydroelectric power supply. I will briefly summarize the Corps current involvement in hydropower development and production and the policies under which we provide for new development.

Through various statutes beginning with the Flood Control Act of 1938, Congress has directed the Corps to take the potential for hydroelectric power development into consideration when developing plans for water resources projects. On the basis of these plans, Congress has authorized numerous projects that involve hydropower development. Hydroelectric power produced at Corps facilities accounts for over 27 percent of the Nation's total hydropower production. The Corps is the single largest producer of hydroelectric energy in this country. The Corps operates 75 hydropower projects and has approximately 21,000 megawatts of production capacity. This is 3 percent of all the electric power generated. Section 5 of the Flood Control Act of 1944 and other acts provide that power developed at Corps projects will be turned over to the Secretary of Energy for marketing.

NATIONAL HYDROPOWER STUDY

In the Water Resources Development Act of 1976, Congress authorized the Corps of Engineers to conduct a National Hydropower Resources Study. This study examined the potential for additional hydroelectric power at both Federal and non-Federal sites. This study was completed in 1983 and later updated in 1988. The 1988 update contains information about the status of hydropower at over 350 Corps dams. The information on each dam includes the location, physical characteristics, existing and/or potential hydropower capacity and energy, and Federal Energy Regulatory Commission license activity by non-Federal developers. The study indicated that an additional 6,180 megawatts of capacity could be generated at Corps projects. This technical information has been shared with and is being used by state and local governments as well as private industry and would be of value to the Secretary of Energy in undertaking the study proposed in Section 4203 of S. 341.

POLICY ON NON-FEDERAL HYDROELECTRIC POWER PRODUCTION AT CORPS OF ENGINEERS PROJECTS

We support the development of economically feasible, environmentally sound hydropower projects. Moreover, it is our policy to encourage non-Federal development of hydropower potential where it is practical.

At existing Corps projects non-Federal development is approved through the Federal Energy Regulatory Commission licensing procedures. Hydroelectric power development must be compatible with the authorized purpose of the Federal project. In addition, design, construction and operation of all power facilities that would be an integral part of the dam or that would affect the structural integrity of the Federal dam must be approved by the Corps. Before 1987, non-Federal interests constructed 38 power plants at Corps facilities. Today there are 63, a 60% increase in just 4 years. In addition, there are currently 10 projects under active construction and 46 licensed projects in design stages.

When non-Federal development is impractical, generally at existing Federal powerhouses or where Federal development has been authorized by Congress, it is our policy to develop power with non-Federal financing. This is consistent with the principle that Federal project outputs which are fully vendible not be financed by Federal treasury. Under this policy we have recently completed power addition at our Town Bluff, TX, project and are proceeding with the addition of new facilities to the power house at Ft. Gibson Lake, Oklahoma.

OPERATION AND MAINTENANCE AT CORPS PROJECTS

The Corps has the continuing challenge to operate and maintain the hydroelectric energy infrastructure under its jurisdiction in this time of scarce Federal resources. Funding for operation and maintenance has steadily increased over the past several years. The President's Fiscal Year 1992 Budget includes a 15 percent increase over Fiscal Year 1991 appropriations for operation and maintenance of hydropower facili-

ties. Also, the Corps Fiscal Year 1992 budget request places high emphasis on maintenance of existing infrastructure and includes a request to initiate major rehabilitation on six projects, one of which is the Bonneville power plant.

Mr. Chairman, this concludes my statement. I will be happy to answer any questions that you have.

Senator CONRAD [presiding]. Thank you very much for that testimony.

And now we will go to our final witness of this panel, Mr. Schmitten, Regional Director of the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration.

Welcome, and if you would proceed with your testimony, then we will have time for some questions.

STATEMENT OF ROLLAND A. SCHMITTEN, REGIONAL DIRECTOR, NORTHWEST REGION, NATIONAL MARINE FISHERIES SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, DEPARTMENT OF COMMERCE

Mr. SCHMITTEN. Thank you very much, Mr. Chairman and members of the Energy and Natural Resources Committee. It is a privilege to appear before the committee and provide comments concerning the provisions of title IV, and specifically, subtitle C, that dealing with hydropower, of the National Energy Security Act of 1991.

Mr. Chairman, I would ask that our prepared statement be submitted for the record.

Senator CONRAD. Without objection.

Mr. SCHMITTEN. Thank you.

Again, I am Rolland Schmitten. I am the Northwest Regional Director for the National Marine Fishery Service. We are a part of NOAH, the National Oceanic and Atmospheric Administration, and our parent organization is the Department of Commerce.

As the Regional Director, I am charged with the preservation, the protection, and the perpetuation of the living marine resources in nine western States.

Pertinent to comments on this legislation, we do manage the anadromous—primarily salmon and steel head resources—in the Columbia and the Snake system, as well as having habitat responsibility in both of those areas.

With me today is Mr. Merritt Tuttle. He is the Division Chief for the Environmental and Technical Services Division, which is located in Portland, Oregon. Mr. Tuttle has over 20-years experience associated with the development of waterways in the northwest. But more specifically, for 15 years, he was responsible for reviewing and overseeing proposals for hydropower development in Washington, Oregon, and Idaho, whenever those projects or proposed projects had anadromous fish impacts. Mr. Tuttle will assist me in answering questions the committee may have.

I would like to take this opportunity to very briefly discuss NOAH's role in hydropower development. NOAH is an active participant at many hydroelectric proceedings before the Federal Energy Regulatory Commission, FERC, based primarily on statutory obligations to assure adequate production of anadromous fish such as salmon, steel head, and striped bass for commercial, recreational, and Indian-tribal fisheries. These obligations derive from

the Federal Power Act, from the Fish and Wildlife Coordination Act, and the Magnuson Fisheries and Conservation Act. It is important to note that both the Departments of Commerce and the Departments of the Interior have legal trust obligations to recognized Indian tribes in the northwest.

Protection and restoration of fisheries resources are major policy and economic objectives for the Department of Commerce and NOAH. When hydroelectric projects, particularly projects affecting the habitat of anadromous fish are constructed and operated without necessary fish protection measures—primarily fishways—commercial, recreational, and Indian tribal fisheries in the United States and Canada will suffer significant consequences.

Over the years, fish mortality and habitat degradation caused by hydropower development have depressed fish populations and resulted in curtailed fisheries. For example, in the Columbia River Basin alone, the Northwest Power Planning Council estimates that hydropower projects are responsible for annual losses of at least 5 million adult fish—and that is compared with historic productions.

Consequently, NOAA believes that statutory protections currently afforded fisheries in the Federal Power Act are important and should continue to be considered in the future hydroelectric proceedings.

Mr. Chairman, that does conclude my testimony. We will provide the—we are pleased to provide this testimony, and we would be happy to answer any questions that the committee may have.

[The prepared statement of Mr. Schmitten follows:]

PREPARED STATEMENT OF ROLLAND A. SCHMITTEN, REGIONAL DIRECTOR, NORTHWEST REGION, NATIONAL MARINE FISHERIES SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, DEPARTMENT OF COMMERCE

Mr. Chairman and Members of the Committee, thank you for the opportunity to be here today. I am Rolland Schmitten, Director of the Northwest Region of the National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA) within the U.S. Department of Commerce.

NOAA supports increased efficiencies and expansion of U.S. hydropower resources in a manner that does not irreparably harm the Nation's fisheries resources. The Department of Commerce supports the Administration's position in this regard. The Administration's comments on S. 341 are being presented by the Department of Energy.

I would like to take this opportunity to briefly discuss NOAA's role in hydropower development. NOAA is an active participant in many hydroelectric proceedings before the Federal Energy Regulatory Commission (FERC), based primarily on statutory obligations to assure adequate production of anadromous fish, such as salmon, steelhead, and striped bass, for commercial, recreational, and Indian tribal fisheries. These obligations derive from the Federal Power Act (FPA), the Fish and Wildlife Coordination Act, and the Magnuson Fisheries Conservation and Management Act.

Protection and restoration of fishery resources are major policy and economic objectives for the Department of Commerce and NOAA. When hydroelectric projects, particularly projects affecting the habitat of anadromous fish, are constructed and operated without necessary fish protection measures, commercial, recreational, and Indian tribal fisheries in the United States and Canada can suffer significant consequences.

Over the years, fish mortality and habitat degradation caused by hydropower development have depressed fish population and resulted in curtailed fisheries. For example, in the Columbia River Basin alone, the Northwest Power Planning Council estimates that hydropower projects are responsible for an annual loss of at least 5 million fish, compared with historical production. Consequently, NOAA believes that statutory protections afforded fisheries are important and should continue to be considered in future hydroelectric proceedings.

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Mr. Chairman, this concludes my testimony. I would be glad to try to answer any questions the Committee might have.

Senator CONRAD. Thank you very much. I thank all the witnesses for their initial testimony. And now we would like to get to the fun part and have a chance for some questions.

Let me ask you, Mr. Kelly, if I might. In your judgment, as part of an overall national energy strategy, which is really what we are about here, what we are trying to put together, should this country, as part of a total plan to build the energy infrastructure of this country, to reduce our dependence on foreign oil, be actively encouraging hydro development?

Mr. KELLY. Well, yes, sir, I think it should. The spirit behind the National Energy Strategy is one of market choice. The Government will not set down a policy of saying, we are going to build so many nuclear power plants or so many hydro plants or so many coal plants, but to let the best source of power win, if you will, in the marketplace.

But in order for that to take place, we have to make sure that our regulation of the various power sources is efficient and proper. We have just passed the Clear Air Act, for example, which, to use a little bit of jargon, takes the external cost of coal burning imposed on society and internalizes it into the coal industry or the electric utility industry, so that people can properly judge the cost of burning coal.

We would want to do the same thing for nuclear. We would want to do the same thing for hydro. What we want to make sure of is that we do not make hydro, or any other power source, for that matter, unduly expensive because our regulations are inefficient.

Senator CONRAD. Let me just intercede if I might. Is it your analysis that the current regulatory regimen has done precisely that? They do not have the charts here today; we have displayed them in the past. It is a Byzantine process that one goes through to license and relicense hydro facilities. Would you say that that is a correct characterization of what is required?

Mr. KELLY. Yes, sir. The hydro licensing process is too long and too expensive, so that people cannot correctly evaluate the cost of hydro power at its true cost, as opposed to the cost of producing the power plus the cost of meeting all of the regulatory requirements.

Indeed, there is the potential added effect that certain developers may be scared off, if you will, by the regulatory process so that we do not get certain hydro projects brought to the market so they can have a market test.

Senator CONRAD. Let me just add as parenthetically, as an observation. This, fairly stated, is more than simply a marketplace response, because if you go through the National Energy Strategy, we are doing all kinds of things in terms of research dollars that are provided by the Federal Government and other initiatives to actually encourage certain investments for the long term, with the goal of obviously altering the mix of energy sources that are available.

I mean, if we had just a market response, we would do what we have been doing, which is to become 50 percent dependent on foreign sources of crude oil.

Let me ask you this. In your judgment, what effect will this bill have on future hydro licensing?

Mr. KELLY. Well, it will make it less costly, more efficient, and will bring forth more hydro power than we would otherwise have. Perhaps, more importantly, it will help retain more of our existing hydro capacity than without the proposed reforms.

Senator CONRAD. And how dramatic a reform do you see this as being? Are we talking about changes around the edges? Or are we talking about significant change, or are we talking about dramatic change? How would you characterize what the essence of this bill contains with respect to hydro?

Mr. KELLY. Well, we think it is an important change that will dramatically simplify the process but, we hope, without dramatically altering the outcome. In other words, we would like to see responsible environmental protection take place, but simply more efficiently and at less cost.

Senator CONRAD. Let us go right to the heart of the question. With respect to the Nation's fisheries, in your estimation, and based upon your evaluation, what would the effect of this bill on the welfare of the Nation's fisheries?

Mr. KELLY. Well, our intent is that the welfare of the Nation's fisheries would be very little affected. I might say, Senator, that at this point I would like to call on my colleague, Paul Carrier, to contribute what he might have in answering that question. He has worked for many years with this particular aspect of it.

Senator CONRAD. We would be glad to hear from Mr. Carrier.

Mr. CARRIER. Thank you. I would like to just confirm this. As supported by the studies that we have done for the NES, the NES provisions, and the very similar provisions in S. 341, contain safeguards in the FERC process. These would allow FERC to give good consideration to the fisheries resources, as well as the other resources that would be affected by the project, to balance these resources, and to come out with a license for a project that is in the best public interest.

Senator CONRAD. Do you have specific studies that would tell us what the effect would be on the Nation's fisheries, of the changes that are proposed in this bill?

Mr. CARRIER. No specific studies.

Senator CONRAD. You have reached a conclusion on, what do you draw on to reach your conclusion?

Mr. CARRIER. The conditions that would be in the licenses, we expect, would be very similar to those that are currently in licenses. What we are doing is streamlining the process so we can get to that point a lot more quickly.

Senator CONRAD. Let me ask you then a follow-up question I will direct at Mr. Kelly. And if it is appropriate to refer to Mr. Carrier, feel free to do so. There is a cross-over point, or an exemption level of 5 megawatts in the proposed legislation.

Can you give us the rationale for that threshold and tell us what the effects would be, both economic and in terms of environmental effects of that cutoff? What is the underlying thinking behind that cutoff point?

Mr. KELLY. Well, sir, the intent of the Federal Power Act is to have the Federal Government involved in important, large-size

hydro projects that have an effect on interstate commerce or navigable waterways.

We believe that projects under 5 megawatts would, in these days of 1,000-megawatt nuclear and coal plants, have relatively little effect on the interstate commerce in electricity, and would have little effect on the navigable waterways under authority of the FERC. These are going to be projects that have effects that are primarily local, and are well within the capabilities of State and local authorities to regulate.

We would, however, preserve Clean Water Act section 401 certification authority for all projects, even those that come under 5 megawatts.

Senator CONRAD. Mr. Underwood, if I might direct some questions at you. Could you give us a description or an analysis of the Bureau's efforts to uprate its own hydro facilities? What has been done in that area? What would be your report to this committee on what is occurring with respect to uprating your own hydro facilities?

Mr. UNDERWOOD. Let me just try to summarize. Our average age of our generators are about 37 years old. Especially in some older generators, you do have some substantial amount of benefits that you can get from uprating in terms of capacity and energy.

We had concluded after a 1977 study entitled, Western Energy Expansion Study, that operating of units was the most immediate and cost-effective, environmentally acceptable means to contribute to meeting the energy needs.

As of January 1 of this year, we have uprating 36 units with an increase in capacity of over 1100 megawatts. We also have the potential for uprating additional 30 generating units, keeping in mind that we have 52 power plants and 190 units. Primarily the ones that are more susceptible to upratings are the ones that are pre-1960; you get more out of them.

If development led to increases in technology in terms of superconductivity, potentially in the future you could go through another type of an uprating program that would, again would allow for increases in capacity and energy.

Senator CONRAD. So tell me again. What do you see as the opportunity that is out there for uprating? Have you got an analysis that tells you what additional power generation could be accomplished and at what cost at the facilities that are existing?

Mr. UNDERWOOD. We have done, in terms of our existing, like I indicated, our existing program and looking at the potential generating units, the other 30, and we are doing studies in terms of their economic justification.

We, on the average, if you look at what we have been doing in terms of uprating, and look at the 30, the 36 units we have already uprated on the average, the operating costs are about $48 a kilowatt.

Senator CONRAD. And how would that compare to competing forms?

Mr. UNDERWOOD. My specialty is really in hydropower. You may want to refer to some of the other potential costs from some of the other energy sources.

Mr. KELLY. Well, sir, the cost of adding new generation today is near $1,000 a kilowatt, more or less depending upon the fuel type of generation.

Senator CONRAD. So we have got a substantial opportunity here, in an economically competitive way, to increase production?

Mr. UNDERWOOD. Yes.

Senator CONRAD. And is there an aggressive pursuit of that opportunity?

Mr. UNDERWOOD. We are currently and within the Bureau of Reclamation we are looking at our program. In other words, looking at opportunities to, potentially to encourage the uprating, additional uprates. But also other opportunities in terms of pump-back storage and also participation, obviously, by non-Federal entities in adding power plants to our existing facilities.

Senator CONRAD. Well, could you tell this committee what is the dollar amount of the opportunities that you have identified that would be cost-competitive?

Mr. UNDERWOOD. I think we could provide some information in terms of the costs related to those facilities, yes.

Senator CONRAD. Do you have any notion of what we would be talking about? Are we talking about $100 million of uprating that would be cost-competitive? Or $500 million?

Mr. UNDERWOOD. I cannot say right off. I can furnish it for the record, though, the analysis of where we are.

[The information requested was not received at the time the hearing went to press.]

Senator CONRAD. Let me turn to Mr. Dickey, if I might, and ask you the same question. Does the Corps have a program to uprate its hydro facilities, and if so, could describe the results?

Dr. DICKEY. I would say, Mr. Chairman, that we have an ongoing program of review of the state of our existing facilities and the opportunities for uprating them. I might point out that one budget initiative we have this year is to give greater visibility to major rehabilitation of our projects. And we propose, in the 1992 budget, the rehabilitation of six Corps projects. One of those projects is the Bonneville hydropower facility.

So, through the high visibility afforded in the budget to major rehab, we want to make sure that we have the funds available to do these as necessary.

Senator CONRAD. How much money have you asked for in the last fiscal year and this fiscal year for the purpose of uprating?

Dr. DICKEY. I do not have that number with me, Mr. Chairman; we will supply it for the record.

[The information referred to follows:]

In fiscal year 1991 the Corps did not uprate any of its hydropower facilities. In fiscal year 1992 the Corps has requested $8 million to uprate the Bonneville hydropower facility.

Dr. DICKEY. It is a modest amount, to be sure.

Senator CONRAD. Senator Craig?

Senator CRAIG. Thank you very much, Mr. Chairman. Maybe to follow along with your line of questioning, to you, Mr. Underwood, and also to you, Mr. Dickey. In looking at the proposed legislation,

in section 4203, in talking about studies to be performed for cost-effective opportunities for increasing hydro production.

How would you respond if the bill said we would like each one of you to bring forth five of, at least of the fastest, greatest, best opportunities to be authorized in this legislation instead of to be studied? How long would it take you both to provide that? Or in fact does that information not already exist within your agencies or departments?

Mr. UNDERWOOD. This would be additional development?

Senator CRAIG. In other words, if this were authorization to do the kinds of things you are doing, either to upgrade, new development, general improvement; in other words, to bring on line greater units of power production from a current or new facility?

Could you not now, based on what you now have available, on-the-shelf information, without spending years studying it, provide enough information to move this committee to a point of authorization?

Mr. UNDERWOOD. We have substantial information. I am not sure in terms of authorization, but there is a substantial amount of information available and we have been updating some of that in more recent times. So we do have a handle in terms of, I would want to take a look at that data in terms of if it were to be ready for authorization, we do have some——

Senator CRAIG. If I gave you 6 months to do that, could you have that information for this committee to move on?

Mr. UNDERWOOD. I believe we could have some substantial information for you, yes.

Senator CRAIG. Mr. Dickey?

Dr. DICKEY. I would say that, with regard to authorization, I must say I have some reservation there. I would point out that we have considerable authority to uprate our existing units, and in some places we have power authorized where it has not yet been built.

So there is a residual, an important residual of remaining authority. When you start talking about additional authority to add more power houses or more units, then you are talking about perhaps substantial environmental impacts, which I suspect would take more study.

Senator CRAIG. You would want to spend quite a bit of time studying it, then?

Dr. DICKEY. Yes. I think we would need to.

Senator CRAIG. The thrust of my question I think is quite obvious. Do we study this, or are we in fact in an energy crisis and we get on with the business of bringing more energy on line?

You know, what does this bill do? I think we have heard Mr. Kelly say it is going to produce more energy. I have yet that question. I do not see anything in this bill that, by the process, at least of this section, would produce 1 kilowatt of power or 1 kilowatt of more power. Until, in fact, this committee moves on the studies that are proposed, which will take years to accomplish, when, in fact, I think we are hearing from you that this work is already on line.

If there is a sense of urgency here, it is a question of commitment on the part of this Congress to cause you folks to act in the proper way. Am I out of line in saying that?

Dr. DICKEY. I would say, sir, that the thrust here, and I think it is certainly the policy of the Corps, to encourage non-Federal development where possible. And indeed, as I pointed out in my testimony, we have a number of projects that have been built under the FERC licensing procedure at Corps projects, and there has been some acceleration in that. So I think of the Corps, and the thrust here of this legislation, to further facilitate that licensing process. And to the extent that that can be achieved, I think would be a worthwhile goal.

Senator CRAIG. Mr. Schmitten, we have heard you talk about the role of National Marine Fisheries. You are engaged now in a very fascinating study under the direction of the Endangered Species Act in the Columbia Snake River systems and watersheds.

One of the proposals that is being looked at at this moment by what is known as the Salmon Summit Group, a group put largely together at the encouragement of Senator Hatfield, has proposed a reduction by given action of the systems, of that river system, of 1,000 megawatts of firm power production for the purposes of fleshes to allow smolts to move downstream.

Now, we have heard Mr. Underwood speak to all of the rehab that has gone on, as having increased approximately 1,000 megawatts of power, I believe. And yet we are seriously looking at the potential of the reduction of 1,000 megawatts of power within that system by both private and Federal projects on both the Snake and the Columbia system.

I guess my question has to be to you, how do we deal with the question of fish? It is a legitimate one, I do not think anyone on this committee would deny that.

And with the ability to at least maintain and/or increase the capability of those river systems in the production of power in a region of the country which already its projections show it is going to need considerably more power? And I do not even want to broach the question of irrigation, and maintain something of the semblance of what we currently know as both an economic base from power production's standpoint, and economic base, from agricultural, and irrigation standpoint in that region of that country, and solve our problems? Is that possible?

Mr. SCHMITTEN. Thank you, Senator. Actually, I think what you are envisioning is a recovery plan for the entire basin. Let me specify a couple of things. First of all, the Salmon Summit and its differences from the review that we are doing.

The Salmon Summit is constituted by Senator Hatfield, admitted that there are problems, very similar problems that you have outlined for fisheries management. And he has asked his summit to look at solutions. The difference between that and what the Endangered Species Act mandates the Secretary of Commerce at this point, is we are to go in and do or conduct a biological review, determine if the problems are real. And we are doing that.

As you know, four of the petitions actually rest in your State of the five that we have received. So the Salmon Summit de facto will be looking at solutions, similar things that you have suggested. If

we have a listing, I suspect, Senator Craig, that you will be looking at a multifaceted recovery plan including habitat recovery, better flows, better passage, certainly some harvest modifications, constraints.

It will be a multidisciplinary recovery that effects a lot of people, but no one exclusively. It will put no one totally out of business. And I think it draws a line between the review that we are doing and the review that was done for spotted owls.

So, very difficult. It will only come about if we work together. It will only come about will cooperation of the States, especially the State of Idaho. The other States, the Indian tribes, in a negotiated cooperative fashion. And thus far, that is the approach that we have taken to the endangered species listings.

Senator CRAIG. The reason I asked that question, and it is not off in left field from this particular piece of legislation and a national energy strategy, at least in the hydro area of that strategy, and whether we are in fact coping with the real problems that we find out there.

Do you believe at this time that the Endangered Species Act provides enough latitude, or limits you in your ability to study and understand the problem?

Mr. SCHMITTEN. I think the act is adequate as it currently stands. Let me——

Senator CRAIG. Even if you cannot find the amount of fish that are being taken in the rearing waters of the Pacific? Even if you do not know that information? Even if you do not know the number of fish being gill-netted on the river?

Mr. SCHMITTEN. The act will allow us to start a recovery if we determine that the numbers that you are suggesting are truly below such a threshold that it would mandate an endangered or threatened species classification. The act then prescribes, and I think prescribes well, what steps are required after that.

For fish passage is critical; it is crucial. Without passage, we have no fisheries. And fisheries in the Northwest, for all of the Northwest States, are something that is associated with really the health of man. It is, the environment and fisheries go hand in hand. I think the act does a good job.

To give you an idea of where we have come from and how far we have to go, originally there were between 12 and 16 million adult salmon coming back to the Snake and Columbia system. Today we have 2.5 million, primarily because of early hydropower development.

Senator CRAIG. I guess, Senator Murkowski had asked me to cover a question as it related to the difference between what NES proposes and the 5-megawatt hydro project versus the 1.5 that is currently under FERC jurisdiction, Mr. Chairman. And I think that generally has been covered.

I do not believe I have any further questions at this time. Thank you very much, Mr. Chairman. Thank you, ladies and gentlemen.

Senator CRAIG. Senator Burns.

Senator BURNS. Thank you, Mr. Chairman. I, just looking, I have probably got more questions for the next panel than I have for this one. But I would address some policy questions that address maybe policy and the direction we should be going.

Did I understand someone to say that even though we, if we went back and retrofitted and take in consideration the cutback in power it is going to take to deal with the situation there on the Columbia River, that we were not going, even though we go through this whole process, we are not going to increase output of power? Did I hear that?

Everybody turns around and looks at one another. Evidently, I did not.

[Laughter.]

Senator BURNS. That would be—I would ask, Mr. Kelly, does the Department agree or disagree with the EPA's views with respect to section 401 of the Clean Water Act, as expressed in their January 19 letter to FERC, in which EPA claims that the Clean Water Act must be read expansively to include nonwater quality issues? Do you remember that letter?

Mr. KELLY. I do not believe I saw the letter, Senator Burns, but perhaps my colleague has.

Mr. CARRIER. I did see the letter, Senator. And the Department of Energy believes that the water quality certification in some cases is incompatible with the licenses that FERC is considering to issue.

And in those cases, we believe that the comprehensive evaluation of all the resources that FERC does as part of its licensing process, in balancing the benefits of all of the uses of these resources, that to the extent that a water quality certificate provides conditions that are inconsistent with the license for projects at existing dams, that the license should prevail.

And so to that extent we feel that there is some impediment to hydropower development through the water quality certification process.

Senator BURNS. Approaching the problem from that standpoint, is it your opinion that under those standards there will never be another new dam or facility built in the United States?

Mr. KELLY. No, sir. Just as a partial follow-up to your previous question, the Department of Energy does believe that the breadth of coverage of the conditions for the 401 certification should be confined to what properly is water quality, and should not be expanded to such other things as recreation, as I am told sometimes is the case.

And so if they are properly confined and if water quality is properly controlled, that certainly would not prevent expansion or creation of new hydropower facilities.

Senator BURNS. Thank you. If the Federal Government is not interested or willing to fully develop the hydroelectric potential at Federal facilities, I would like to have your opinion of—do you think they should be opened up for private development?

Mr. KELLY. Well, yes, sir, I believe it is already in part Federal policy to allow private developers to come in and assist in development at Federal projects.

Senator BURNS. Okay, we will go into that. I will have some more questions, I guess, on the legislation as it moves along. That is all the questions that I have at this time. Senator Conrad, thank you.

Senator CONRAD. Thank you very much, Senator Burns. I would just like to return, if I could, to this question of how much of an

opportunity is out there with respect to existing facilities? What precisely is being asked for and what should we be doing to realize the opportunity that may exist?

And let me just turn to Mr. Underwood again and ask you. In your judgment, how significant is the opportunity and is your agency aggressively pursuing the appropriations dollars to do the upgrades that would be necessary to realize those opportunities? Is there any way you can quantify it for me beyond what you have already done?

Mr. UNDERWOOD. A couple of points, and I am not sure you heard this before in terms of our 1990 budget request for reclamation. There is a proposal for expenditures of $35 million for uprating. Of that $35 million, $25 million went for non-Federal or revenue-financed sources for the uprating programs. So we are aggressively pursuing that, based on budget priorities.

Senator CONRAD. What I am trying to get a handle on is how much of the opportunity does that represent? Does that represent 10 percent of the known opportunity out there? Or are we talking about 50 percent? Can you give us some reading?

Mr. UNDERWOOD. We can provide some information for the record in terms of the opportunities, where we are now. And like I indicated to you that we have 36 units operating, we have potential for 30 more. Some of those have to do with time. Like I indicated, we have 192 units but some of those are not economical to uprate because you do not have the opportunities that you do with some of the older units.

We also have opportunities like have been mentioned for non-Federal development or non-Federal financing at some of our existing facilities. And we can identify those for you.

Senator CONRAD. I just know in my own State, at Garrison, that there is an opportunity there for significant uprating. Every study I have seen shows that it would be cost effective, very attractive economically, and yet it has not been aggressively pursued. Can you give me a reason why it has not been?

Mr. UNDERWOOD. From a Federal point of view, probably money. Again, trying to encourage non-Federal development or at least revenue finance, or non-Federal revenues, to allow for that. Again, it gets into the budget priorities. As I indicated, we have been doing a substantial amount of work within this past year about updating a lot of the information that we had in terms of potential.

Senator CONRAD. Anything along those lines you could share with the committee, I would certainly be interested in seeing.

Mr. UNDERWOOD. I would be happy to do so.

Senator CONRAD. Thank you.

Senator BRADLEY [presiding]. Let me, if I can, move into some other questions. First, Mr. Underwood—and check me if I missed something, but I do not think I have—in our letter to the Secretary, we asked him to provide a witness who would testify on behalf of the Department of the Interior.

And I know from your testimony that you are, as usual, knowledgeable in testifying about the Bureau of Reclamation. But I do not see anything here from the Fish and Wildlife Service. Are you speaking for the Fish and Wildlife Service?

Mr. UNDERWOOD. Yes. I am speaking for the Department.

Senator BRADLEY. So——

Mr. UNDERWOOD. Especially the other agencies that have reservations, land reservation, like BLM and Park Service.

Senator BRADLEY. And Native Americans?

Mr. UNDERWOOD. Yes.

Senator BRADLEY. So your testimony reflects the Department position?

Mr. UNDERWOOD. Yes, that and the views of the Department of Energy relative to the specifics on the bill.

Senator BRADLEY. Okay, I think you have probably gone down a lot of the questions on supply. I would like to ask Ms. Marlette, if I can. Under current law, what percentage of State and Federal fish and wildlife recommendations does FERC accept as hydroelectric license conditions?

Ms. MARLETTE. I do not have that figure with me, but I would be happy to provide it.

[The information referred to follows:]

STATE AND FEDERAL FISH AND WILDLIFE RECOMMENDATIONS

The Commission issued 293 license and capacity related amendment orders subject to fish and wildlife agency recommendations from October 16, 1986, when the Electric Consumers Protection Act was signed into law, through February 28, 1991. Of the 293 orders issued, in 213 or 73 percent of the orders the Commission staff concurred with the recommendations of state and federal fish and wildlife agencies. Further, of the 293 orders issued, conflicting recommendations were resolved through the section 10(j) process in 35 or 12 percent of the cases; 29 or 10 percent of the cases were found to be outside the scope of section 10(j); and in 16 or 5 percent of the cases the fish and wildlife agencies' recommendations were held to be inconsistent with section 10(a) and/or 4 (e) of the Federal Power Act (FPA).

Viewed in terms of individual recommendations, the statistics are more favorable. Of the 1,614 recommendations provided by state and federal fish and wildlife agencies for the 293 orders issued, the Commission staff concurred with 1,398 or 87 percent of the recommendations. Further, of the 1,614 recommendations, 54 or 3 percent of the conflicting recommendations were resolved through the section 10(j) process, 128 or 8 percent of the recommendations were found to be outside the scope of section 10(j), and 34 or 2 percent of the recommendations were held to be inconsistent with sections 10(a) and/or 4(e) of the FPA.

It should be noted that of the 216 recommendations found to be in conflict with the FPA, 102 or 47 percent of those recommendations involved 14 licensed projects assessed under the Ohio River Basin Environmental Impact Statement. Further, the 14 licensed projects also contributed to 98 out of 128 or 77 percent of the recommendations that were found to be outside the scope of section 10(j).

Senator BRADLEY. Does the removal of mandatory conditioning power under sections 4E and 18 of the Federal Power Act imply some reduction in environmental protection within the hydroelectric licensing process?

Ms. MARLETTE. Under section 10 of the Federal Power Act, the Commission has to take into consideration fish and wildlife, environmental, other nondevelopmental considerations in its licensing.

I cannot say whether it will or will not result in a reduction, but I can say that the Commission has a mandate to take into consideration those concerns.

Senator BRADLEY. Let me ask a somewhat similar question. The provision of the bill that prohibits States from attaching conditions other than that which pertains to clean water. Is that, one of the arguments is that FERC is the adequate place to deal with some of these concerns. What is your view?

Ms. MARLETTE. I believe that FERC is the adequate place. I think that there is a real need for a centralized review process. FERC is, as I said, mandated to balance all interests, including environmental and nondevelopmental.

And I would also say that there is no intent, I believe, in either S. 341 or the provisions that we proposed, to oust State and Federal agencies from the process, and that the Commission would fully take into account their recommendations.

Senator BRADLEY. Mr. Schmitten, how does the bill affect the Department of Commerce's responsibility with regard to hydro licensing?

Mr. SCHMITTEN. Mr. Chairman, there is two areas of specific concerns. One, 4202-E, which would remove our license conditions for fish way prescriptions. And the second would be 4202-F, and again, that would remove both the Federal license and the fish protection requirements for hydro projects less than 1,500 megawatts. Those are the two significant areas that we feel that it impacts fisheries management.

Senator BRADLEY. Does the bill reduce the amount of protection and consideration that fisheries will receive in the course of the hydro licensing process?

Mr. SCHMITTEN. Significantly.

Senator BRADLEY. It does reduce? How?

Mr. SCHMITTEN. It would remove our equity or our standings in those two areas. And those are areas that we feel that we can provide the necessary protection for our mandate to protect fish.

Senator BRADLEY. So you see it as reducing the welfare of the Nation's fisheries?

Mr. SCHMITTEN. Yes, sir, that is my personal belief.

Senator BRADLEY. Well, if the, were you asked earlier about whether it makes any sense that the National Marine Fishery Service have mandatory conditioning power with respect to fish ways and hydroelectric projects?

Mr. SCHMITTEN. I was not. If I was——

Senator BRADLEY. I am asking, does it?

Mr. SCHMITTEN. No, it was not. I would respond that, I view, first of all, we are not opposed to energy development. There should be cooperative, multipurpose use of water. And we should not pit agency against agency. We have learned a long time ago in the Northwest to begin to cooperate and negotiate our settlements. And I think we learned that in our dealings with our Native Americans.

And that is the approach that I apply to problem-solving, and I see this as a problem. The way to the solution is start early, work with FERC, work with the applicants. We have a success record, if we do that, that we can cut down on time and save them money.

Senator BRADLEY. So you say that, even though, you know, the FERC has this separate process and they do consult you and they frequently defer to you, you think that that is not sufficient?

Mr. SCHMITTEN. I think what is currently in the Federal Power Act is sufficient. I do not think that any agency should have such clout over another agency that it would diminish the overall goals of the Nation. And I think that the balance is going to change.

And all we ask for is equity; we ask that we be heard and we ask that we be at the table. And I think that by that type of process, we can do a better job for serving you and the public.

Senator BRADLEY. Let me ask Mr. Kelly, if I could, if all the provisions of this act were enacted, how much more hydroelectric power would the Nation have?

Mr. KELLY. Senator, I do not have an exact figure. We did ask ourselves that question with respect to the National Energy Strategy, which contains similar, but not identical, provisions. And we thought that there would be in the neighborhood of 16,000 megawatts more electric capacity, counting both new hydrofacilities and upgrades at existing facilities.

Beyond that, we would—in addition—retain some capacity that we now have that we would perhaps otherwise lose. That is in addition to the 16,000 megawatts.

Senator BRADLEY. That is how much more would you retain? I mean roughly, given the age.

Mr. KELLY. Pardon me?

Senator BRADLEY. Given the age of the facilities, how much more would you retain?

Mr. KELLY. Of the existing? Let me ask Mr. Carrier to confirm my memory on this. I recall 22,000 megawatts is subject to relicensing.

Mr. CARRIER. Our National Energy Strategy study shows implementation of the National Energy Strategy actions would result in a total increase of about 22,000 megawatts of hydropower capacity. That is 16,000—16,000 to 17,000—more than what would occur without the NES options. There would normally be a slight increase in hydropower capacity even without these actions.

Senator BRADLEY. So net——

Mr. CARRIER. That is net.

Senator BRADLEY [continuing]. Because of the strategy is 16,000 megawatts.

Mr. CARRIER. Net, because of the strategy, is 16,000. That takes into consideration some losses that would occur.

Senator BRADLEY. For the public, how many people could that serve? Roughly, what is the average annual consumption?

Mr. KELLY. That is a tough one. I am trying to recall a calculation I did a few weeks ago where we looked at how many people would be served by a 1,000 megawatt nuclear plant. And I believe it was a city of roughly 300,000. So if you were to multiply 300,000 by 16, that would give you an answer in the neighborhood of 5 million people.

And I would like a chance to correct that if the arithmetic I just did in my head later proved wrong. But I believe that is the answer.

Senator BRADLEY. So what you are saying is that the energy derived from these provisions is significant?

Mr. KELLY. Yes, sir.

Senator BRADLEY. Let me ask the Bureau how much hydroelectric energy is used each year to pump water from the Bureau projects?

Mr. UNDERWOOD. That, Mr. Chairman, I do not have. I could potentially provide it for you.

[The information requested was not received at the time the hearing went to press.]

Senator BRADLEY. Well, do you think, based upon your feel and your knowledge, that that power might be used more efficiently?

Mr. UNDERWOOD. Without a doubt, there is ways of making power more effective and efficient use of power.

Senator BRADLEY. Do you think that water conservation at various Bureau irrigation projects could reduce the use of project power for pumping?

Mr. UNDERWOOD. I think in a particular case it is not just the water conservation. Even the scheduling, so that you can reduce peak—either peak water deliveries or peak energy deliveries. I think there is some substantial opportunities for water conservation to help in both of those regards.

Senator BRADLEY. Do you have any analyses of individual projects to determine whether project deficiencies could be improved to reduce energy requirements? Have you done those kind of analyses?

Mr. UNDERWOOD. There may be some I am not knowledgeable about, if there are some presently available. You are talking about water conservation efficiencies of the projects themselves. Relating it to energy, I cannot really say if we do or do not at this time.

Senator BRADLEY. Well could you provide that for the record?

Mr. UNDERWOOD. Sure.

[The information requested was not received at the time the hearing went to press.]

Senator BRADLEY. What is the Bureau's or the Interior Department's policy regarding private hydroelectric development on Bureau facilities? That is including dams and canals.

Mr. UNDERWOOD. No, we encourage non-Federal development. Or if it cannot be from the development itself, non-Federal funding, financing.

Senator BRADLEY. How many FERC-licensed projects are operating on Bureau dams as of now?

Mr. UNDERWOOD. I believe—and I would like to have an opportunity to verify this—but I think it is 43. That includes ones that are on like canals, low hydroheads and stuff. If I believe correctly, I think it is 43.

Senator BRADLEY. Well, do they all lease the power privileges at Bureau facilities?

Mr. UNDERWOOD. Pardon me?

Senator BRADLEY. Do you lease the power privileges?

Mr. UNDERWOOD. Those are under various types of agreements for the development of those facilities, yes.

Senator BRADLEY. What opportunities have you identified for building off-stream pump, storage projects?

Mr. UNDERWOOD. There has been some. There is a Spring Canyon one off of Lake Mead which is obviously a large-scaled pump-back storage. There is other opportunities—again, the ones that we have identified I could make available to the committee.

Senator BRADLEY. With the amounts as well?

Mr. UNDERWOOD. Yes.

Senator BRADLEY. All right, do you think that the price at which Federal hydropower is sold has any affect on the efficiency with which the power is used? This is kind of 101.

[Laughter.]

Mr. UNDERWOOD. I think in many, you know, I think in most cases if you look at the entities that are using it, whether it is for pumping water or for other sources, people have come obviously to the realization, like water and energy, there is a limited resource there. And you are dealing with generally public entities.

So in terms of efficiency of use, I think they are striving to improve the efficiency. Whether price would play a role, obviously, probably. I have been involved in water pricing studies in the past and stuff. Some of them have merit. They do have merit to a certain point. But it is not something that saves the day, so to speak. But obviously it is an important part or an integral part.

Senator BRADLEY. Okay, what is better?

Mr. UNDERWOOD. Pardon me?

Senator BRADLEY. What is a better way to improve efficiencies?

Mr. UNDERWOOD. Most of them—and like I indicated, most of these—are based on cost of services, looking at Federal facilities. With a limitation on the amount of energy sources available, that is really going to drive, I think, also efficiency, I mean improvements in efficiency—same thing as driving in terms of our upgrading program.

Senator BRADLEY. The what?

Mr. UNDERWOOD. The limitation in terms of other sources of energy. That is—I mean that is what driving, when you were talking about the cost—I am not sure you were here when they were talking about the cost of $1,000 a kilowatt hour versus some sorts of energy, versus like operating at $48 a kilowatt. That obviously gets to improving efficiencies when you look at the alternatives.

Senator BRADLEY. In terms of your own role in this with the Department of Energy, I mean do you think your role is adequate?

Mr. UNDERWOOD. Role meaning?

Senator BRADLEY. Development of the energy plan, management of——

Mr. UNDERWOOD. We are supportive of the administration's position, yes.

Senator BRADLEY. And how would you say the bill affects FERC's authority regarding Bureau facilities?

Mr. UNDERWOOD. There is—obviously there is some problems in terms of streamlining the process. And this addresses that in terms of the licensing procedures.

Senator BRADLEY. Okay, well let me thank you all very much for your testimony. And it has been helpful. And I appreciate your taking the time in preparing it.

Our next panel consists of Gail Ann Greely, past president of the National Hydropower Association; Richard Hunt, consulting engineer, Richard Hunt Associates, Annapolis; Richard H. Silkman, Maine State Planning Office; David Conrad, water resources specialist, National Wildlife Federation; and John Echeverria, vice president of American Rivers.

Welcome to the committee. I know there are others trying to get to the committee. Why do we not begin with Gail Ann Greely, and then Richard Hunt, and then the others as they arrive at the table.

If you could, I would like you to limit your presentation to 5 minutes.

STATEMENT OF GAIL ANN GREELY, ON BEHALF OF THE NATIONAL HYDROPOWER ASSOCIATION, ALAMEDA, CA

Ms. GREELY. Thank you. My name is Gail Greely. I am managing partner of Pacific Hydroconsulting Group of Alamedia, California. I am also the past President of the National Hydropower Association.

The National Hydropower Association has provided a written statement for these proceedings and I would like to ask that it be entered into the record.

Senator BRADLEY. Your full statement will be in the record.

Ms. GREELY. Thank you.

I had the privilege in September of 1989 of testifying before the Subcommittee on Water and Power about the problems that were plaguing with the hydropower industry dealing with the complex, time-consuming and expensive, regulatory process.

I am very pleased to be back here to comment on S. 341 and its provisions that would correct some of the problems we identified at that previous hearing.

I think the best thing I can do to demonstrate to this committee that these problems are still with us is to show you a copy of the January hydroregulatory report that the National Hydropower Association publishes.

The very fact that we have a regulatory report—and it is our most popular member service—tells you a lot about the state of our industry. But I noticed in this particular issue, last month's, that on page 2 there was a report of a continuing controversy about a section 401 water quality certification in New York. The case has now reached the appellate division of the New York State courts.

That 401 controversy at least concerns water-quality matters, including dissolved oxygen and temperature. But as we mentioned in our written statement, there are plenty of 401 water-quality certifications that go well beyond what we would normally think of as water quality, including a small project in California that has conditions for the protection of wolverines and mule deer. I may be wrong about this, but I do not think that either one of those is an aquatic organism.

On the following page there is a comment on a case involving section 4(e) of the Federal Power Act. In that case, both the Bureau of Reclamation and the U.S. Forest Service had conditioning authority under section 4(e). The conditions they imposed conflicted both with the FERC's authority to administer its licenses and with its authority to collect charges for the use of Government land.

The Commission, unfortunately, could do nothing about this. It is simply required to include those conditions, even though they directly undermine its own statutory authority.

On the next page was a case, another FERC case, on section 18 of the Federal Power Act. This one was a rejection of some conditions

proposed by the National Marine Fishery Service, as fishway prescriptions. The condition that was rejected was a prescription of instream flow releases for a section of river that had no anadromous fishery. And yet, that was a section 18 fishway.

Now to illustrate how S. 341 addresses these problems that were discussed in this report and also in our testimony, I have brought back the infamous chart from the September 1989 hearing. I apologize for its size. This is the pocket version of the chart.

Senator BRADLEY. Oh, yes.

[Laughter.]

Ms. GREELY. Well, to the pleasure of many in this room, I have defaced this chart. I have written on it. I know this looks like a micro-chip from where you are sitting, Mr. Chairman, but we will provide this copy of the chart to the committee. But what I have done is mark in red some of the changes that are made by this bill. And I have also updated it a bit. I made a correction based on an FERC staff comment. There had been an error in the earlier chart.

I have also marked out the State water rights proceeding in which the Supreme Court's Rock Creek decision—to which the Supreme Court's Rock Creek related. And I have a question mark down here, next to the right-of-way permit process under the Federal Land Policy and Management Act. That particular matter is up before the Ninth Circuit at this time.

What the provisions of S. 341 do are basically pull some of these permits and conditioning authorities back into the FERC process, pull them up into the main stream of its decision-making process. The water quality conditions from the 401—those that really are water quality—come immediately into the license. The rest of them get evaluated by the FERC as recommendations.

The 4(e) conditions also get pulled into the process where FERC can evaluate them as part of its overall balance. And, what was previously a section 18 fishway prescription becomes part of the section 10 shade that was created by ECPA. Those become fish and wildlife recommendations that are entitled to deference and which become the basis of the FERC's conditions for the project, unless the FERC finds them to be inconsistent with the overall purposes of the act.

The net effect of this on the environment, I think, is pretty much zero. The provisions do not eliminate a single opportunity for comment or recommendations from the agencies. They do not compromise the thoroughness or the quality of the environmental review. They do not undermine the effectiveness of an agency recommendation that is reasonable and well supported.

The thing I cannot show on this chart is the affect of the other provisions of S. 341 affecting hydro—the cut of the FERC's jurisdiction for projects below 1.5 megawatts and the changes to ECPA implementation. We have many questions about how those are intended to affect the process and how they will be implemented. It will be our effort to try and make sure that the outcome of that change—of those changes—is to have more hydropower and not less.

If we do not change this system, we end up with the same mishmash we have now. We end up with a process that produces con-

flicting conditions, that produces crippling duplication, delays and time expense.

I think we all know the old saw that a horse designed and built by a committee is a camel. Well, the hydropower project, that is licensed by multiple competing and conflicting State and Federal agencies, is a gas-fired combustion turbine.

Thank you for your time.

[Laughter.]

[The prepared statement of Ms. Greely follows:]

PREPARED STATEMENT OF GAIL ANN GREELY, ON BEHALF OF THE NATIONAL HYDROPOWER ASSOCIATION, ALAMEDA, CA

My name is Gail Greely and I am an attorney and consultant with Pacific Hydro Consulting Group of Alameda, California a small independent firm specializing in hydropower regulation. I am here today representing the National Hydropower Association, of which I have been President for the past year. The National Hydropower Association is a non-profit organization founded in 1983 to support the common concerns of the hydropower community in maintaining the viability of hydropower as a low-cost, reliable source of renewable energy. Its members include project owners and operators, equipment manufacturers, as well as engineering, legal, financial and consulting firms from all regions of the country.

I had the privilege of testifying before this Committee's Subcommittee on Water and Power in September of 1989 regarding the complexities of the hydropower licensing process.[1] Using a chart the width of the hearing room to illustrate the current regulatory process, I tried to point out how duplication, jurisdictional overlap, and interagency conflict have produced crippling delays and uncertainty. Testimony from other industry representatives provided vivid examples of the regulatory process at its worst and pointed out how the process itself is discouraging expansion of our nation's hydropower resources.

Because they correct some of these problems in the licensing process, the National Hydropower Association strongly supports the hydropower streamlining proposals in the Johnston-Wallop Bill S. 341 will improve the hydropower licensing processing by reducing interagency conflict—breaking the logjam.

HYDROPOWER MATTERS

S. 341 is a complex and comprehensive energy bill, covering a broad range of energy topics, including transportation, fossil fuel exploration, energy efficiency and utility regulation. In this vast array of issues, hydropower doesn't look like very much. Does hydropower matter—is it worth the effort to streamline the hydropower licensing process?

Hydropower matters because today every energy resource matters. International events have taught us that we cannot afford to ignore our domestic energy resources—particularly, clean, renewable resources like hydropower. Hydroelectric generation makes up about 10% of the total electric energy produced in the U.S. But this number underestimates its value to the electric system. Hydro's unique characteristic's provide America's utilities with critical system reliability and operating flexibility. Because it is the only energy technology, except for a car battery, that can store energy, hydropower enhances system reliability. Both conventional and pumped storage facilities serve as efficient, low cost spinning reserve, provide voltage stabilization to the transmission grid and with their instantaneous response capabilities ensure protection against blackouts.

These existing hydroelectric facilities are not the limit of hydro's potential. The Federal Energy Regulatory Commission estimated in 1988 that a total of 74,000 MW of undeveloped conventional hydropower capacity existed in the U.S.[2] Development of this additional hydropower is not inconsistent with responsible environmental protection. By adding 80,000 MW of new hydropower generation, we could displace 138 million barrels of oil burned to make electricity each year. Much of that new

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[1] Hearing before the Subcommittee on Water and Power of the Committee on Energy and Natural Resources, United States Senate, One Hundred First Congress, First Session, on Hydroelectric Regulation Under the Federal Power Act, September 28, 1989, pp. 133-149.

[2] Federal Energy Regulatory Commission, *Hydroelectric Power Resources of the United States, Developed and Undeveloped*, January 1, 1988.

hydro could be constructed at existing dams—as much as 24,000 MW by the Department of Energy's estimates.[3]

Existing federal dams also offer significant opportunities for expanding our hydropower base. DOE projects that 16,000 MW could be developed at existing federal facilities, through both upgrading of existing electric plant and adding a power component to other federal dams. Section 4203 of S. 341, requires the Secretary of Energy to study opportunities for power production at federal facilities. Such projects are often very cost-effective to construct and environmentally benign. Many have already been authorized by Congress, but have not been pursued for lack of funding. Identification of power opportunities in the DOE study may open up these facilities to non-federal investment, driven by the realities of the electric marketplace.

Hydropower is also America's first choice among electric resources, according to a recent national survey by management consultants Booz, Allen & Hamilton. Hydropower was the preferred power source by almost a 2 to 1 margin of those polled, ranking it number one in every region of the country. These results reflected the public's assessment of the environmental impacts of various technologies. Only 4% felt that hydropower was very harmful or extremely harmful to the environment, compared to 65% for nuclear, 56% for coal, 47% for oil and 14% for natural gas.[4]

THE EXISTING REGULATORY MORASS DISCOURAGES HYDRO

So, what's stopping us? Why aren't we building more hydro? There are many factors that go into the decision to develop a new hydropower facility or expand an existing site. Evaluation of environmental, engineering and economic feasibility are central to a site-specific decision. But what our members tell us, is that site-specific factors are overridden by the regulatory complexities and uncertainties of the current permitting scheme. S. 341 addresses a number of areas that are of particular concern to the hydropower community.

Clean Water Act Section 401 Water Quality Certification

Section 401 of the Clean Water Act requires an applicant for a federal hydropower license to obtain certification from the state water quality agency that the project complies with state water quality standards. Any conditions of the certificate to protect water quality are then incorporated into the project license. Because the FERC cannot issue a license without 401 water quality certification, the denial of certification is an effective veto of the license. The Commission has interpreted the statute to require licensees whose 401 certification is denied or to which unreasonable conditions have been attached, to seek redress in the state courts.

Neither will the FERC determine what elements of a Section 401 certification constitute valid water quality conditions. The FERC incorporates the entire certification, by reference, into the federal license. Unfortunately, agencies in many states have expanded the scope of their water quality review to include non-water quality issues.

The Environmental Protection Agency is now encouraging state agencies in this broad view of Section 401 certification. In a January 18th letter to the FERC, the EPA Assistant Administrator defended the scope of state 401 review of hydro projects and read the statute to include nearly any condition related to water use.[5]

A January 30th EPA letter to the Attorney General of Maine is even more explicit. Responding to a decision of the state court narrowly construing the scope of Section 401, EPA described the 401 as "authority to consider whether the operation of the dams would interfere with . . . the designated uses of fishing, aquatic habitat, and recreation." The State of Maine is appealing the state court's decision, but EPA warned: "If the State is unsuccessful in its appeal, the [EPA] Region will be forced to evaluate whether EPA should become the certifying agency in Maine because of a lack of state authority resulting from the decision." [6]

Section 401 certifications in New York have contained conditions for state review of dam safety and facility maintenance. A licensee was also required to submit analyses of the impact of continued project operation on stream ecology, fisheries, recreational uses, aesthetics, power generation and waste assimilative capacity.[7]

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[3] National Energy Strategy, Interim Report, A Compilation of Public Comments, April 1990.

[4] Booz, Allen & Hamilton, Inc., Press Release, November 7, 1990.

[5] Environmental Protection Agency January 18, 1991, letter to the Federal Energy Regulatory Commission.

[6] Environmental Protection Agency January 31, 1991, letter to the Attorney General of the State of Maine.

[7] Water Quality Certifications issued by the New York State Department of Environmental Conservation to Niagara Mohawk Power Corporation dated November 15, 1978, and October 12, 1978.

A small project in California has a Section 401 certification with conditions to protect wolverines and mule deer from disturbance during construction.[8] These are not aquatic organism. The conditions are not water quality related.

Conditions like these are slowly being challenged in the state courts, and in four cases to date, the courts have construed the Section 401 mandate narrowly.[9] In the Maine state court decision reversing the state agency's denial of 401 certification, the court wrote:

> A mandate to promote design and construction of additional recreational facilities or fish passage facilities to revitalize uses disrupted by dam construction 85 years ago is not within the powers assigned to the Board by Maine's water quality laws. These may be legitimate public policy goals, the court makes no comment on that, but the water quality certification process is not a broad enough legislative mandate to achieve such goals.[10]

But hydroelectric projects often can't afford lengthy state court battles. Nor can federal energy policy be subject to individual decisions in the courts of the fifty states.

Section 4(e) Mandatory Conditions For Federal Reservations

Another conflicting authority is the power of the federal land management agencies to put conditions in the FERC license for the protection of the federal reservations. As interpreted by the Supreme Court, Section 4(e) of the Federal Power Act covers conditions reasonably related to the protection of the reservation and supported by substantial evidence in the record.[11] Unfortunately, this provision has also been expanded and abused.

Waiting for the Forest Service to provide its conditions can hold up a hydro project for years. One California licensee has three projects that have been "stalled" in the FERC relicensing process for up to four (4) years waiting for the Forest Service to decide what conditions to impose.[12]

Many of these conditions also go well beyond the statute's reasonable scope. The "standard" Section 4(e) conditions used by the Forest Service include conditions for separate USFS review and approval of design drawings, land use charges in excess of those collected by the FERC and a requirement to obtain yet another permit, the special use authorization. In fact, the Forest Service anticipates conflict with the license, so many licenses contain the condition: "In the event there is a conflict between any provisions of the license and Forest Service special use authorization, the special use authorization shall prevail on matters which the Forest Service deems to affect National Forest Service resources." [13]

Project-specific conditions are developed through the Forest Service's own separate environmental review under NEPA. The result is further conflict. The Section 4(e) conditions in a recent license for an Idaho project require the licensee to obtain USFS approval before making any changes to the project and require extra payments to the Bureau of Reclamation for use of BOR land.[14] These conditions conflict with the FERC's authority to administer the license and to collect land use charges. Another California project has two completely different instream flow requirements written into its license—one from the FERC and another from the Forest Service.[15] That license was eventually surrendered by the project proponent. The project was never built.

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[8] Water Quality Certification issued by the California State Water Resources Control Board to Henwood Associates, Inc., dated October 3, 1986.

[9] *Bangor Hydro-Electric Co.* v. *Board of Environmental Protection,* No. CV-90-53 (Sup. Ct. Me. October 16, 1990); *Fourth Branch Associates* v. *Department of Environmental Conservation,* 550 N.Y.S.2d 769 (App. N.Y. 1989); *Arnold Irrigation District* v. *Department of Environmental Conservation,* New York Supreme Court November 15, 1989; *Commonwealth of Pennsylvania, Department of Environmental Resources* v. *City of Harrisburg,* Commonwealth Court of Pennsylvania, June 26, 1990.

[10] *Bangor Hydro-Electric Company* v. *Board of Environmental Protection,* No. CV-90-53 (Sup. Ct. Me. October 16, 1990).

[11] *Escondido Mutual Water Co.* v. *La Jolla Band of Mission Indians, et al.* 466 U.S. 775 (1984).

[12] *Pacific Gas and Electric Company,* FERC Project No. 1061 (Phoenix Project); FERC Project No. 1333 (Tule River Project); FERC Project No. 1354 (Crane Valley Project).

[13] *Pacific Gas and Electric Company,* FERC Project No. 2735 (Helms Creek Project) Order Amending License (August 23, 1989).

[14] *Boise-Kuna Irrigation District, et al.,* FERC Project No. 4656, Order on Rehearing (December 6, 1990).

[15] *Dale L.R. Lucas,* FERC Project No. 8160, Order Issuing License (Major Project—Unconstructed), 40 FERC 62,205 (August 20, 1987).

Section 18 Mandatory Fishway Prescriptions

Another conditioning authority, similar to Section 4(e), is the Section 18 mandatory fishway prescription. Section 18 of the Federal Power Act allows the National Marine Fisheries Service to "prescribe" fishways that the FERC must include in the license.

So, what's a fishway? According to N.M.F.S., a fishway can be just about any measure to enhance fisheries. At a project in Washington, N.M.F.S. tried to "prescribe" minimum flows for downstream fish passage as a Section 18 "fishway" on a stretch of river that has no anadromous fishery.[16]

The U.S. Fish and Wildlife Service has a similarly broad interpretation. For a Connecticut project, U.S.F.W.S. "prescribed" a whole list of fishery measures as "fishways", including draft tube screens, post-construction fish monitoring, and limitations on license amendments.[17]

Waiting for N.M.F.S. to decide on its prescription can also lead to significant delays. An Oregon project was before the FERC for seven (7) years. Much of the delay in the later years was the result of N.M.F.S.'s refusal to "prescribe" the "fishway" until it had before it an acceptable fishscreen design.[18]

Delays During The FERC's NEPA Review

Substantial delays also occur in the FERC's review of hydropower licensing and relicensing applications. As seen above, some of this delay can be traced to the failure of other agencies to provide the FERC Staff with their comments and recommendations. Repeated denial of a Section 401 certification request by a state agency, or rejection of the request as incomplete, can indefinitely delay FERC action on a license application and effectively avoid the Clean Water Act provision waiving certification if the agency does not act within one year. Under the Commission's current policy, two 401 denials gets your license application thrown out completely.

Delay of other agency participation, including Section 4(e) conditions, Section 18 prescriptions, and fish and wildlife recommendations under Section 10(j), can hold up licensing for months or years. The other participating agencies rarely have an incentive to move quickly, and the FERC's authority to enforce comment deadlines has been questioned.

The FERC also contends that licensing delays are sometimes the result of Commission manpower shortages and budget limitations. Because the costs of administering the Federal Power Act, including costs incurred by the FERC and other federal agencies, are reimbursed through annual charges assessed against hydropower license holders, it is hard for the industry to understand why the FERC doesn't have enough money. "Creative financing" may be what it takes to get the job done.

WHAT S. 341 DOES TO IMPROVE HYDROPOWER LICENSING

S. 341 addresses these problems with simple, common sense adjustments to the current licensing process.

Clarification of Clean Water Act Section 401 Water Quality Conditions

Section 4201 of the bill will prohibit states from including conditions in Section 401 certifications for hydropower projects that are not needed to protect water quality. It authorizes the FERC to determine which conditions are properly part of the 401, and to disregard those outside the permissible scope. The FERC will still be bound to incorporate the state's conditions for water quality protection, but conflicts in areas that should be exclusively within the FERC's authority will be reduced. State procedures for administering water quality certification will remain intact, and the FERC's decisions will be subject to judicial review in the Court of Appeals.

Incorporating Federal Land Management Issues Into The Resource Balance

Section 4202 revises the Federal Power Act by eliminating that portion of Section 4(e) that gives authority to federal land agencies administering reservations to condition the license for a hydropower project located within the reservation. Instead of the mandatory conditions of Section 4(e), Section 4202 will add a new subsection to Section 10(a) requiring the Commission to take the recommendations of the land

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[16] *Northern Wasco County People's Utility District*, FERC Project No. 7270, Order Denying Rehearing (December 21, 1990).

[17] *Windsor Locks Canal Company and Windsor Locks Hydroelectric Limited Partnership*, FERC Project No. 8404, Order Issuing License (Major Project-5 MW or Less), 49 FERC ¶ 62,300 (December 27, 1989).

[18] *Eugene Water and Electric Board*, FERC Project No. 3109-001, Order Issuing License (November 16, 1989).

management agency concerning the protection and utilization of the reservation into consideration in the licensing decision. Land management issues will be addressed and the expertise of the land agencies will be recognized, but the final decision will be a part of the FERC's evaluation of the overall public interest. Again, FERC's treatment of these issues in the licensing decision will be subject to judicial review.

Combining Fishway Recommendations With Other Fish And Wildlife Issues

Section 4202 also deletes that portion of Section 18 of the Federal Power Act concerning fishway prescription, but leaves intact Section 10(j)(1), which assures that fishery recommendations of the National Marine Fisheries Service and U.S. Fish and Wildlife Service will be fully considered by the Commission. While the mandatory fishway prescription is eliminated, a recommendation from N.M.F.S. or U.S.F.W.S. for fishladders, fishscreens or other fishery measures will be given deference. They would be excluded from the license only if the Commission determined that the recommendations were inconsistent with the overall purposes and requirements of the Federal Power Act. Judicial review will ensure that the FERC does not arbitrarily or capriciously reject these agency recommendations.

Excluding Projects Under 1.5 MW From FERC Jurisdiction

Another feature of Section 4202 is the amendment of Section 23 of the Federal Power Act to exclude hydroelectric projects under 1.5 MW capacity from FERC licensing jurisdiction. The members of NHA have been unable to reach a consensus on this proposal, largely because we have so many unanswered questions. It is unclear how this would affect applications already on file for small projects, or what it would mean for the relicensing of existing small facilities. Would small additions to existing licensed facilities be under state or federal jurisdiction? Without F.E.R.C jurisdiction, how could approval be obtained to add small generating facilities at existing government dams?

A jurisdictional cut-off may provide some acceleration of licensing for larger projects by reducing the Commission's workload, if staffing and budgets remain near current levels. For the projects under 1.5 MW, subject to a variety of local, state, and federal permits, the overall impact is unknown. States that do not currently have a comprehensive permitting system for hydroelectric projects, and even some that do, may develop new regulatory frameworks to process approvals for the small projects that would become their sole responsibility.

NHA also recognizes, as Congress has, that even the smallest hydroelectric project can affect important federal interests. Many small hydropower projects are located on federal land or interstate waterways. Nearly all affect the regional market for electricity and the flow of power through interstate transmission grids. Even small projects can offset fossil fuel combustion and contribute to the lessening of regional and global air quality problems. Without a role for a federal agency charged with a comprehensive evaluation of hydro projects within the context of national energy and environmental policy, these project effects may be overlooked.

Alternatives to the proposed 1.5 MW jurisdictional cut-off in S. 341 might be to make FERC jurisdiction over these small projects optional. Another approach would be to modify the current exemption program to further limit FERC jurisdiction over some types of small projects.

Affirming The FERC's Lead Agency Role Under NEPA

Section 10003 of S. 341 addresses the FERC's procedures for compliance with the National Environmental Policy Act, for gas pipelines as well as hydropower facilities. Subsection (a) clarifies that the FERC is the lead agency for NEPA compliance and can set reasonable time limits for consultation with other federal agencies. While other federal agencies will continue to be active participants in the NEPA environmental review process, the management of that process will improve. Duplicate NEPA documents prepared by other federal agencies will be discouraged and timely responses to requests for comment will be encouraged.

Authorizing The Option Of Third Party Contracting For NEPA Review

Subsection (b) of Section 10003 addresses another aspect of NEPA compliance. It authorizes the FERC to establish procedures for the use of third-party contractors to prepare NEPA environmental documents. Applicants would have the option to pay for a contractor chosen by the Commission. Procedures for assuring that contracted NEPA reviews are not tainted by conflict of interest would be developed.

As an option for some projects to accelerate the FERC's processing of backlogged license applications, this proposal may provide some near term benefits. However, because we do not know how third party contracting would be implemented at the

FERC, it is difficult for the hydro industry to evaluate its full impact. Direct billing for contractor costs would have to be reconciled with the current system of collecting administrative costs through annual charges. NHA is also concerned that a "two-tiered" system might develop, with lengthy delays for projects that do not choose to pay up-front for a contractor. Proposals to improve the FERC's NEPA process need to look at "how it's done" as well as "how it's paid for."

WHAT S. 341 DOES TO ENVIRONMENTAL PROTECTION

The hydro provisions of S. 341 will not open the floodgates for indiscriminate hydropower development. They do not eliminate a single opportunity for state and federal resource agencies to participate in the licensing process. They do not undermine the deference that Congress accorded fish and wildlife agency recommendations in the Electric Consumers Protection Act of 1986. They do not release FERC from the obligation to give "equal consideration" to non-development values. They do not undercut the FERC's NEPA obligations or undermine NEPA's mandate for thorough environmental review.

The only likely environmental impact of these provisions is to save a few trees by reducing the duplication of environmental paperwork and the number of lengthy legal briefs.

CONCLUSION

These modest proposals to streamline the hydropower licensing process will not undermine important environmental protections. But they will begin to put hydropower back into the resource planning picture. S. 341 will help energy planners predict how long it will take to get a license and how much it will cost. It will reassure them that when they get a FERC license, they will know what to build and how to operate. With that certainty, hydropower can compete with other technologies to meet America's future demand for electrical energy. In that competition, clean, safe, reliable, domestic, renewable hydropower will surely be one of the winners.

The members and staff of the National Hydropower Association would be pleased to work with the Committee and its staff on any issues concerning hydropower. We appreciate this opportunity to present our views on S. 341.

Senator BRADLEY. Richard Hunt.

STATEMENT OF RICHARD T. HUNT, HYDROELECTRIC LICENSING CONSULTANT, RICHARD HUNT ASSOCIATES, ANNAPOLIS, MD

Mr. HUNT. Thank you, Mr. Chairman.

I did provide more lengthy testimony than I will give, and I——

Senator BRADLEY. Your full testimony will be in the record, as will all the witness' full testimony. We are trying to limit this to 5 minutes per.

Mr. HUNT. Okay.

I have had the opportunity, Mr. Chairman, to work on both sides of the fence, so to speak. I have been a licensing hydro engineering and licensing consultant. And I also, in 1986 and 1987, during the implementation of ECPA, was the Director of the Office of Hydro Licensing.

My testimony, summarized, today will address three points on the diminishing resource of hydro. Point one would be original licenses are not being applied for currently, to any great extent. Substantial numbers of projects receiving licenses from FERC over the last few years are not being built. And we have the relicensing issues. We are losing some energy and some capacity on that score.

I think these issues are important to discuss. Because there is additional capacity. Almost everybody recognizes there is additional hydro out there to be used and to contribute to the country. A recent DOE estimate was about 50,000 megawatts. That is about

1.5 times what FERC currently has under license. And about 35 percent of this capacity was at existing dams.

And secondly, 75 percent of the FERC-licensed capacity will be relicensed in the next 20 years, as you described earlier.

I just want to give you an idea of why there are so few applications. It takes about twice as long to receive a license now than it did in 1980, or the early 1980's. It costs about 300 percent more than it did in 1980 to get a license. A hydro plant costs about 70 percent more to develop today as it did in 1980.

Now with those kind of statistics, you look at the purchase price for power. It has remained about the same over the last 10 years. And, in fact, in New England, since about 1984, the purchase price for electricity has actually dropped about 50 percent in some areas.

Just to give you an example, if you take a 1 megawatt project, that is about enough to generate electricity for about 400 homes. In 1980 you could license that facility for an average of about $80,000. And today it costs about $300,000.

Development cost about $1.8 million in 1980. It is about $3 million today. And your gross revenue from such a project, based on an average—assuming it is a run-a-river plant based on average energy revenue—would be $160,000 gross. It would take you about 18 years just to recover the development costs. So you can see what kind of a situation we are in with that increase in cost. There is no increase in purchase price of the power over the last few years.

I think also some people are being scared off. The ability of agencies to place mandatory conditions on licenses is scaring people off, obviously. And the record shows that about one-third of the approved development filings—that is licensing exemption on applications—only one-third ever result in a generating project. So you have two-thirds of them that somehow do not make it even after they get a license.

The second point that I wanted to address—projects not being built that are getting licenses. This is primarily due to the long licensing period. There is no protection against the economic situation. You go through 5 years of licensing. For example, if it was economic when you started, when you come out the other end the pricing may have changed on the purchase power of electricity, and so on and so forth.

So you are in a catch-22. You cannot get a power purchase contract without a license. You cannot get financing without a power-purchase contract. So you sort of go around in that circle. And for the first time in FERC' history, in 1989 and 1990 surrenders and terminations exceeded applications that were submitted.

The third point I wanted to address was a relicensing situation with existing plants. This presents a potential to upgrade. As we know, an existing project that has been operating for 50 years, DOE recently estimated that there is about, oh, 2,200 megawatts or so of existing capability out there—non-Federal capability—to upgrade. So we have an opportunity.

Well, in the early 1980's, it looked like this opportunity was going to be pursued. 40 percent of the projects were expanded. And the average expansion of those that were expanded was about double the capacity. No project relicensed during the 1982-1986 era lost energy.

After ECPA, 60 percent have lost energy and 75 percent of those plants that were relicensed that were peaking plants lost some of their peaking capability. So we have that situation of a loss that is going on there.

I could talk about the definition of base energy and peaking energy, but I think I will just summarize by saying if the current trend continues, based on projecting that into the relicensing of the next 20 years, approximately 8 billion kilowatt hours would be lost of base energy. And that is about 2 million-2.5 million people could be served by that. And the replacement would normally be by fossil because it would be base as about 400 million a year.

Extrapolating on the peaking side, the projects are coming up for relicensing in the 2000-2010 period—there is only a couple of projects about 22,000 megawatts. You are looking at an average size of about 100 megawatts.

The peaking projects relicensed in the 1980's were about—averaged about 12 megawatts. So you are going to see a lot of those projects in that era are big and are used for peaking. And just trying to come up with some numbers, extrapolating—3,000 megawatts or so, probably—could be at risk in that period.

Senator BRADLEY. Period?

Mr. HUNT. In the next 20 years. That includes things that are—there is roughly 4,000 megawatts in the 1990's, and 21,000 roughly in the 2000, 2010. So you are talking 25,000-26,000 megawatts. And there is some substantial peaking capacity in that period.

This loss would be essentially at no cost, no fuel energy. And you would not only have to build a peaking plant to replace it, but you would also have to pay for the fuel to generate the electricity. So you have the cost of the plant installation and the electricity.

And by way of example, there is a current project undergoing relicensing. It is in the process right now, about 300 megawatts. And the agency recommendations really are addressing a cap on the amount of water that could be released during the peak period which is going to restrict the peaking capacity or capability or flexibility about two/thirds. So 200 megawatts is at risk based on the initial recommendations of the agencies there.

I think the overall concern, basically—just in general—is that the capacity to energy output is being reduced. Or, it looks like the recommendations are coming through to reduce it, in some cases substantially, without some measurable objectives, sometimes as a moving target. But the measurable objectives is really what the applicant is looking for. What are we working against here? And how do we balance that objective against the power and the value of the power and the power that is lost. And I think that is probably one of the major concerns.

And just to summarize or complete my statement, Mr. Chairman, to put hydro sort of in perspective—overall, in the country, of the 70,000-odd dams that we have in the country, only about 3.5 percent have a hydro plant on them—just to give a little perspective.

Thank you for your time, Mr. Chairman.

[The prepared statement of Mr. Hunt follows:]

PREPARED STATEMENT OF RICHARD T. HUNT, HYDROELECTRIC LICENSING CONSULTANT, RICHARD HUNT ASSOCIATES, ANNAPOLIS, MD

Thank you for the opportunity to present testimony on the important issue of the decline of hydropower in the U.S. My name is Richard Hunt. As a civil engineer and consultant, I have been involved with hydropower in all of its aspects for 15 years. I was the Director of the FERC's Office of Hydropower Licensing during the implementation of the Electric Consumers Protection Act of 1986 (ECPA). Since leaving the FERC, I have continued to study the hydro licensing process through extensive interviews with current applicants and recent licensees. Using this information, I have produced a two-volume Guide for Developing a Hydro Plant Relicensing Strategy for the Electric Power Research Institute and a data resource, The Status of Hydropower Regulation and Development, 1989.

With my testimony here today, I want to make the point that, as an energy source, non-Federal hydropower is diminishing. Developers aren't applying for licenses to build new facilities because they cannot sell power for enough money to recover their investment. Many approved projects are not being built because they cannot produce a profit in the face of expensive licensing requirements. And existing projects that have been operating for decades are having their production capability reduced in the relicensing process.

During the next 20 years, more than three-fourths of all FERC-licensed capacity will be subject to relicensing. If we don't act now to level the playing field for hydropower, we will soon have to replace this nonpolluting energy source with fossil fuels that are much more costly and more damaging to the environment.

BACKGROUND

Since the late nineteenth century, hydroelectric energy has made a prominent contribution to the commerce and economy of the United States. Hydro turbines generated their first electrical energy in the U.S. as early as 1882. By the 1950's, hydropower was recognized as an environmentally sound method to generate electricity. The Federal Power Act of 1935 established a Commission with the authority to regulate the development and operation of waterpower projects. Since 1940, hydropower's share of the U.S. electrical energy generation has steadily decreased. In the late 1970's, interest in hydropower did increase, however, this did not ultimately result in the development of more resources.

The catalyst for this renewed interest was the Public Utility Regulatory Policies Act of 1978 (PURPA), which established incentives for developing electrical generating plants that used renewable resources. The main purpose of the law was to help reduce the nation's dependence on foreign fuels. Among the renewable resource generating options available at that time, hydropower was a well established technology that had been in place for over a century. In addition, ample sites were available for development—over 70,000 dams in the U.S. that were not equipped with power generating facilities. As a result, hydropower received greater interest and attention than other available technologies.

PURPA was supported by most environmental special interest groups when it was enacted and initially implemented, however, the renewed interest in hydro caused a sudden proliferation of applications and an associated increase in controversy. Environmental special interest groups deplored the consequences of licensing large numbers of small hydro projects and began opposing them. In testimony before congressional committees, these groups predicted that the increase in hydro activity would result in the construction of thousands of new dams and cause serious environmental damage to the nation's rivers. Figure 1 shows the error of this prediction.

In response to their concerns, the Electric Consumers Protection Act of 1986 (ECPA) required that the FERC give "equal consideration" to both power and nonpower resources and granted additional importance to resource agencies in relicensing.

Figure 2 shows hydropower licensing activity and new project development under FERC jurisdiction from 1980-90. Although PURPA generated a substantial number of new preliminary permit, exemption, and license applications in 1980 and 1981, the number of new applications declined in each succeeding year. The pattern for approved applications is similar but not so pronounced. Ultimately, only 54 percent of the applications submitted during this period were approved. However, obtaining approval does not mean that a project will be developed. In this same ten-year period, only 13 percent of approvals actually resulted in operating power plants.

DISCUSSION

PURPA and ECPA were the product of negotiation and compromise. While they provide a good basis and general approach for hydro licensing, much confusion could be eliminated if laws and regulations were strengthened to support FERC's ultimate authority to regulate hydropower. Thirty-seven additional Federal laws (and numerous State laws) can affect the development or operation of hydro projects. The licensing process has been allowed to run amuck through the lack of firm definition, guidance, and overall planning.

New Licenses

Advocates for competing resources fight each new project on a piecemeal basis, increasing development costs, and impeding the overall development. In constant dollars, the licensing costs for hydropower plants have increased 300% since 1980. Today it costs 70% more to develop a hydro plant than in 1980. At the same time, the purchase price of this power has remained the same in most regions of the country and has actually declined 50% in New England.

The following are specific problem areas for new hydro development:

Fragmentation of Authority for Licensing Decisions: Because its authority is not exclusive and is subject to vague and contradictory legal constraints, the FERC often cannot satisfy all affected parties. The following factors contribute to the fragmentation of the licensing process: (1) Federal statutes and regulations that give other agencies indirect control through the right to mandate license conditions; (2) State statutes, regulations, and mandatory permit programs that give State agencies the ability to counteract FERC's authority; (3) Judicial decisions that have expanded the authority of these agencies; and (4) FERC's three-stage consultation process and informal, but established, policy of accepting the overwhelming majority of agency recommendations as conditions for licenses. For example, FERC accepted 100% of all agency recommendations as license conditions for relicenses issued in 1990. Figure 3 shows the recent trend in acceptance of agency recommendations by, the FERC.

Lack of Consensus on Suitable Locations for Hydro Development: Currently, the full burden of identifying a suitable, unassailable site for hydropower development rests with an interested developer. The developer must perform substantial analyses, consult with the public and resource agencies, and file a formal application with the FERC before there is even a preliminary determination of his right to develop a project. There is no definitive mechanism for determining national priorities for use of land and water resources that could be harnessed for hydropower. It will never be possible to eliminate all conflicts and negotiations between competing resource agencies protecting their interests; however, there is a need for some national identification of areas acceptable or unacceptable in a general way for hydro development.

Lack of Economic Incentives to Promote Hydro Development: From 1978-1980, three separate laws were enacted with economic incentives for the development of hydroelectric power projects (Windfall Profits Tax Act; PURPA; and Energy Security Act). All of these incentives had been phased-out by 1986. These incentives could be used to encourage new development at existing dams. Without disturbing free-flowing rivers, regulated hydro development at existing dams offers enhancement of fish and wildlife resources, installation or improvement of recreational facilities, safety requirements, and the generation of electricity with a non-polluting, renewable resource. For example, the Clean Air Act included valuable economic incentives for other renewable technologies but not for hydropower.

Lack of Sufficient Consideration of Hydro Energy Value: In recent years, FERC has devoted very little attention to the value of energy as one of the competing interests to receive "equal consideration" in licensing deliberations. The recommendations of resource agencies are usually accepted at face value (see Figure 3) without formal analysis of their cost-effectiveness. This increases the production cost of the energy without establishing measurable objectives and without balancing the objectives against the energy value lost.

Lack of Usefulness of "Exemption" Category of Licensing: An "exemption" from the requirements of Part I of the Federal Power Act was established in the late 1970's as a way to license hydro projects that meet certain requirements. Exempted projects must rely on existing structures (a dam, a natural water feature, or an existing conduit); the land necessary for development must be owned or controlled by the developer; and the project size cannot be greater than 5 MW for existing dams or water features and 15 MW for existing conduits. Recent judicial decisions have allowed resource agencies to establish man-

datory conditions for "exemptions" that FERC cannot challenge or change. Thus, the "exemption," which was established only for the most environmentally benign projects, has been adjudicated out of the control of FERC.

Lack of Sufficient Time To Begin Construction Following Receipt of an Original License: The Federal Power Act requires a licensee to begin construction of a licensed project within two years of license issuance. The regulations provide for one two-year extension so that construction can be delayed a maximum of four years. The ability of the applicant to begin construction immediately after receipt of the license is influenced by economic considerations including the ability to get a power purchase contract at a favorable price and the ability to borrow development funds at an attractive interest rate. It can also be limited by natural conditions, such as the current drought in California. Since the licensing process can take up to five years to complete, conditions may change during this period. Power rates that made the project feasible when the licensing process began may have declined until the project is no longer profitable.

During the 1980's, 45 percent of the hydroelectric capacity that was licensed by the FERC (1,750 MW) was never constructed because of such conditions. Another 1,500 MW of capacity is currently licensed but construction has not begun. Assuming that about half of this capacity will not be constructed based on recent trends, another 750 MW of licensed hydropower capacity will not be developed in the next five years.

Potential for Expansion at Relicensing

In the early 1980's over 350 operating, non-Federal hydro projects were evaluated to determine if additional capacity and/or electricity production could be developed at these sites (Electric Power Research Institute, 1982). The analysis showed that a net gain of 4,000 MW of hydro capacity and 3.5 billion kwh/yr of hydroelectric energy output could be added through expansion at some of these hydro sites. Such expansions could be made economically and with controlled environmental disruption when these existing projects are relicensed.

Relicenses for Existing Facilities

Although projects that have existed for 50 years experience all of the same licensing difficulties as original projects, the major additional problem for these facilities is the loss of energy and capacity through relicensing.

Loss of Electrical Energy: During the early 1980's, expanding hydro facilities at relicensing was seriously pursued by licensees and regulators. From 1982 through 1986, 40 percent of relicenses issued received approval to expand their facilities at relicensing (see Figure 4). No project relicensed during this period lost power. There was an overall gain of more than 30 percent in capacity and 40 percent in electrical production. The average gain for each expanded project was 120 percent for capacity and 140 percent for electricity production. This approach allowed growth in energy production at existing sites that was economical and minimally disruptive to the environment.

However, the trend reversed itself following the enactment of ECPA. From 1987 through 1990, no relicensed project received approval for expansion and 60 percent (comprising 95 percent of the total capacity relicensed during this period) received new license conditions requiring them to use less water for the generation of electricity. The limits were placed on water usage for electricity production in order to increase the water set aside for fisheries. The loss of power from these requirements averaged 8.5 percent per project.

FERC records indicate that there is 25,600 MW of hydro capacity pending or scheduled for relicensing in the next 20 years. If recent trends continue, the loss of electrical output could reach 8 billion kwh/yr in the next 20 years (see Table 1). This is enough electricity to more than serve all the residences of Dallas and Fort Worth, Texas.

Loss of Peaking Capacity: The loss of electricity alone does not tell the whole story. Current generation makes heavy use of coal and nuclear fuel to adequately meet baseload electrical needs. However, hydropower plants are still a primary resource to meet the increasingly large demands for electricity during periods of peak use because they can be started and stopped quickly and they are economical (low production costs and no fuel costs). This function of hydro plants is also at risk in upcoming relicensing actions.

The trend in post-ECPA relicensings has been to curtail the ability of hydro plants to deliver additional power during periods of peak electricity use. Today's relicenses set limits on the volume of water that can be released at a given time in order to minimize fluctuations in the river's flow downstream from the plant. This is done to establish conditions for new fisheries.

Of the projects relicensed since ECPA, those that operate to deliver peaking power lost an average of 7 percent of their peaking capacity. However, these projects were small, averaging only 12 MW in size. The projects that will be relicensed during the next 20 years average five times larger than those relicensed in the 1980's. The expected limits on the peaking operations of these projects represent much more of a threat to the nation's energy supply. Projecting from the trends of the 1980's, peaking capacity will be about 35 percent of the total hydro capacity scheduled for relicensing in the next 20 years.

Based on the emerging positions of resource agencies in today's relicensing actions and the relicensing experiences of the past decade, a range of 10 to 60 percent of the peaking capacity of each project might be lost. If only 35 percent of the peaking capacity relicensed in the next 20 years is lost, then 3,000 MW of replacement capacity, that uses nonrenewable, combustible fuels, will be needed (see Table 1).

A recent example illustrates the problems applicants face in today's relicensing environment. A large hydro project with a capacity exceeding 300 MW is now being relicensed. The applicant has been advised by fishery agencies that they will recommend a cap on peak flow releases sufficient to reduce the project's peaking capability by almost two-thirds. If FERC accepts this recommendation as a condition in the relicense, as they have done with 100 percent of fishery recommendations in 1990 relicenses, 200 MW of peaking capacity will be lost.

Replacement Cost: The cost to replace the 8 billion kwh/yr of baseload electricity projected to be lost through relicensing actions during the next 20 years will exceed $400 million/year (Table 1). This is ten times the cost of retaining the current hydroelectric output. This assumes that the hydroelectric energy at an average cost of 0.5 cents/kwh will be replaced with energy produced using coal-burning plants at a current production cost of 5 cents/kwh.

The cost to replace 3,000 MW of peaking capacity with the cleanest combustion turbines available could reach $3 billion (Table 1). This replacement cost includes only the installation of the combustion turbines ($900/kw) and does not consider the ongoing cost of fuel to operate these turbines. Fuel to produce the estimated 3 billion kwh/yr of replacement electricity for peak use periods will cost consumers another $75 million each year (Table 1).

WAYS TO ENCOURAGE ADDITIONAL HYDRO DEVELOPMENT

Affirm, in legislation, the authority of the Federal Energy Regulatory Commission (FERC) as final arbiter in balancing the competing interests in the licensing and development of non-Federal hydro projects as established in the Federal Power Act of 1935.

Identify and develop a consensus nationally on areas best suited to non-Federal hydropower development from the perspective of national priorities. This effort could also identify areas that are of particular environmental or cultural significance where hydropower development would be discouraged.

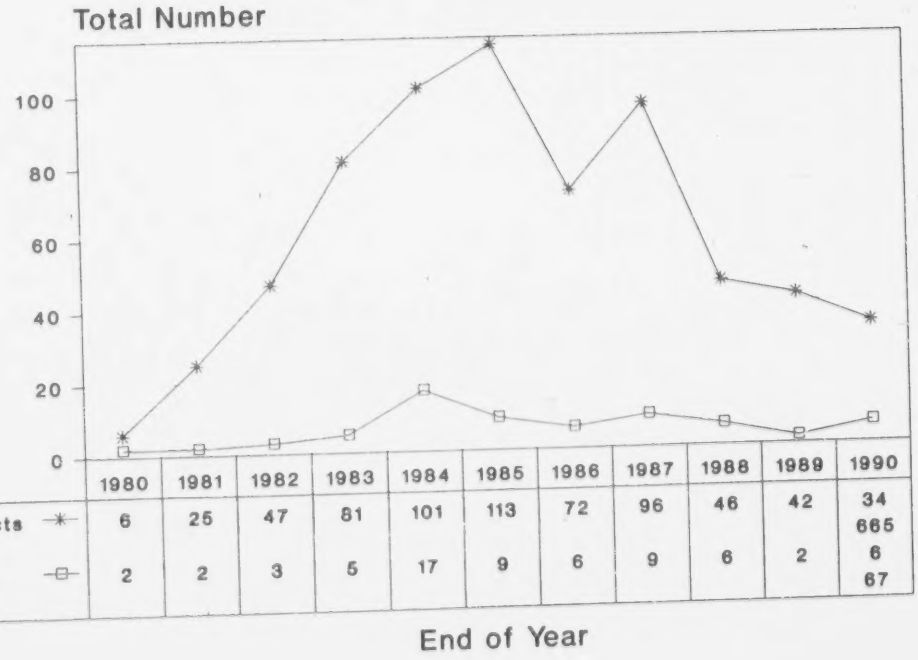
Reestablish economic incentives to promote the development of non-Federal hydropower plants at existing dams.

Assure that the economic value of energy production is given due consideration as a competing interest in the licensing process by the FERC.

Through legislation, remove judicially-imposed mandates as barriers to the "exemption" to again make it an efficient option for licensing a hydro plant.

Amend the Federal Power Act to increase maximum time limit allowed after issuance of a license and before the start of construction, to perhaps 8 or 10 years.

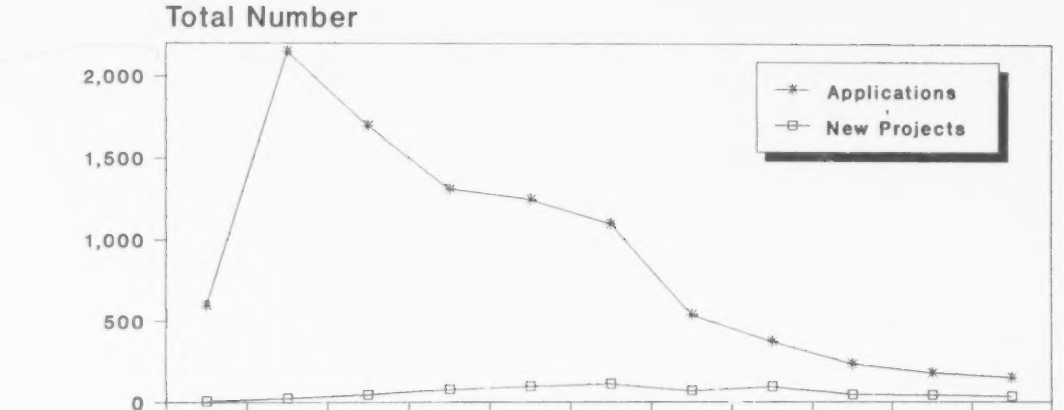
Figure 1
New Conventional Hydro Projects & New Dams Placed In Service 1980-1990*



	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Total Projects	6	25	47	81	101	113	72	96	46	42	34
Cumulative											665
New Dams	2	2	3	5	17	9	6	9	6	2	6
Cumulative											67

*FERC Regulated-Excludes Relicenses

Figure 2
Hydro Applications* And New Projects Placed In Service 1980-1990**

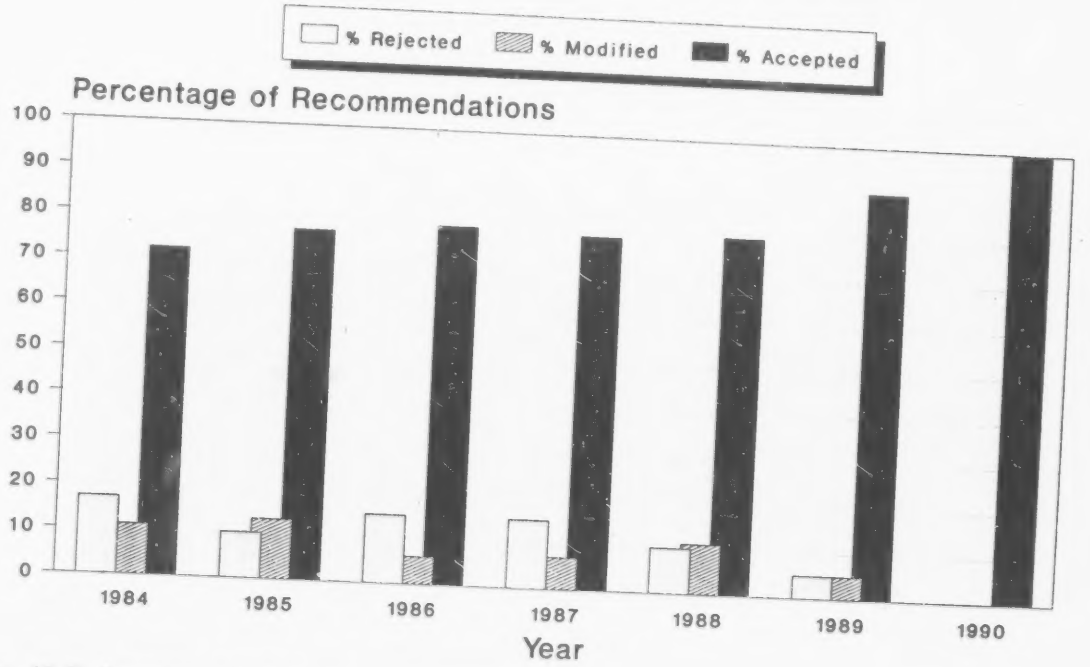


	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Applications	595	2,149	1,699	1,308	1,246	1,099	538	374	237	178	152
Cumulative											9,674
New Projects	6	25	47	81	101	113	72	96	46	42	34
Cumulative											665

*Includes Preliminary Permit, Exemption And License Applications
**FERC Regulated-Excludes Relicenses

Figure 3

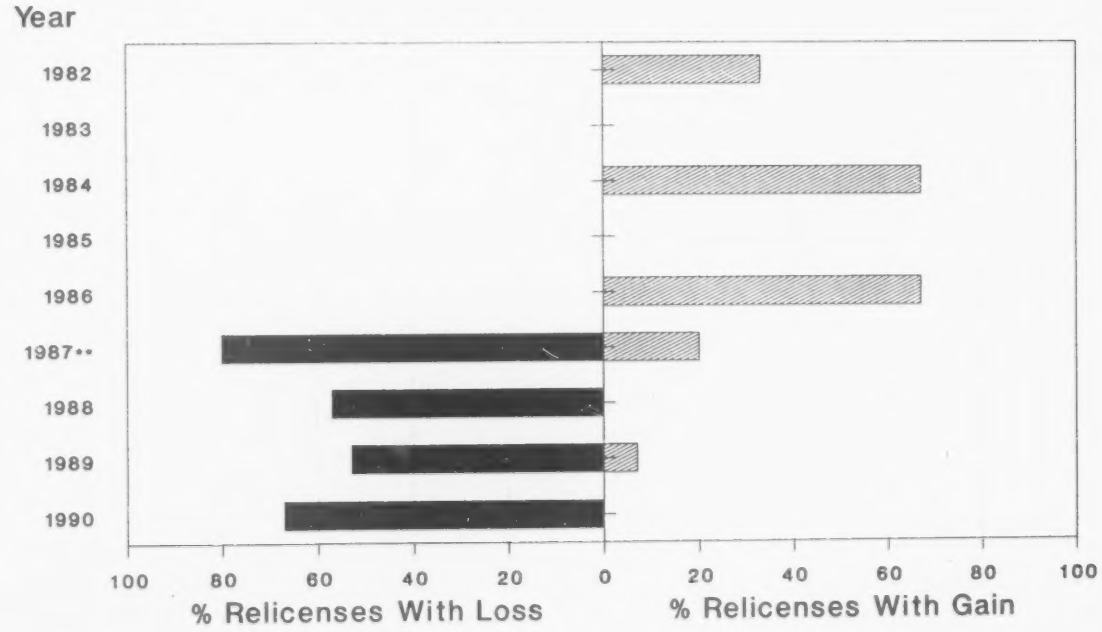
Treatment Of Resource Agency Relicensing Recommendations By FERC 1984-1990



Note: 42 Relicenses-540 Recommendations

Figure 4

The % Of Hydro Projects Losing & Gaining Energy Production @ Relicensing 1982-90*



*50 Relicenses
**First Year After ECPA

Table 1

Projected Hydroelectric Base Energy Production and Peaking Capacity/ Energy Losses at Relicensing Over the Next 20 Years with Estimated Replacement Costs

Category	Projected Loss	Replacement Costs
Base Energy[1]	8 billion KWH/Yr[1]	$ 400 million/yr[1]
Peaking Capacity[2]	3,000 MW[2]	$ 3 billion[2]
Peaking Energy[3]	3 billion KWH/Yr[3]	$ 75 million/yr

Notes:

[1]Projections based on an extrapolation of relicensing statistics from the 1980's. Basis: 95% of capacity operating in base load mode scheduled for relicensing in the next 20 years(total capacity less peaking capacity, or 25,600 MW less 3,000 MW) will be exposed to relicense conditions that result in energy loss; the average loss is 8.5%; the average plant utilization factor is 45%. Replacement costs are estimated at $0.05/KWH.

[2]Basis: 35% of total capacity to be relicensed in the next 20 years is estimated to operate in the peaking mode (or 35% of 25,600 MW) and 35% is projected to be lost. Replacement costs are estimated to be $900/KW(the cleanest combustion turbine available).

[3]Basis: 3,000 MW peaking capacity operating at a plant utilization factor of 12%. Replacement costs are estimated at $0.025/KWH (combustion turbine).

Senator BRADLEY. Thank you, Mr. Hunt.
Mr. Silkman.

STATEMENT OF RICHARD H. SILKMAN, DIRECTOR, MAINE STATE PLANNING OFFICE, AUGUSTA, ME

Mr. SILKMAN. Thank you very much, Senator.

My name is Rich Silkman. And I am currently the director of the Maine State Planning Office. I serve as Governor John McKernan's designee to speak for the State of Maine on matters related to hydropower.

What I would like to do this afternoon is make two points regarding Senate bill S. 341. Before I do, however, I would like to spend just a couple of minutes to share with you why Maine has taken—and will continue to take—such a strong interest in hydropower licensing and relicensing issues.

Because of our historical development and the importance of hydropower, Maine has more hydropower license explorations in 1993 than any other State in the country. And if my numbers are not mistaken, 25 of the first 100 licensings—relicensings, rather—to be done under the 1986 ECPA Act are in Maine. In many respects, Maine is serving as an indicator of the success or failure of this act. And, quite frankly, sir, we feel like a guinea pig as well in the process.

Our hydro relicensings represent 44 percent of our current, indigenous electricity capacity, and fully 10 percent of the total electricity generation of our utilities in the State.

But our river systems support more than hydroelectric power. They are supporting increasingly diversified uses. While they no longer support log drives—have not done that since 1975—they are now supporting new recreational uses, such as white-water rafting and much-enhanced sport fishing. This latter use is now well in excess of a $100 million industry in the State. To put this in perspective, our total lobster catch is valued at slightly under $50 million. And together, white-water rafting and fishing have become mainstays of our tourism industry, the second-largest industry in the State.

I do not think it would surprise you that the State of Maine is generally regarded as a national leader for its activities concerning rivers planning, including hydropower development, water quality, and multiple-use considerations. Nor I do not think it would be a surprise to learn that the State of Maine's Comprehensive River Plan was acknowledged and recognized by the Federal Energy Regulatory Commission as the first of its kind in the country, and is the model for efforts of other States.

Let me turn now to the two points which I would like to make about S. 341. First, we enthusiastically support the provision which eliminates FERC's jurisdiction over hydroprojects of 1.5 megawatts and less. Indeed, we would argue that this threshold should be increased—and increased considerably—and that Federal jurisdiction should be exercised only in those instances where hydropower conflicts with navigation, or where it creates what might be called multistate impacts.

My office recently conducted a study of potential—what we call—low-head hydro in Maine and identified an additional 28 megawatts, which today, given current economics, are feasible to construct. In that study, what was identified as the most significant barrier to their development is the current regulatory process, which was most often characterized as cumbersome, as expensive, duplicative, and perhaps most important, highly uncertain.

We believe that States like Maine are very well equipped to direct, operate and perform hydrolicensing and relicensing activities, especially for existing small-scale projects, and on those rivers which lie wholly within the State of Maine.

The second point which I would like to make is to express our concern about the provision of S. 341 which effectively revokes existing State authority to condition water quality certification under section 401 of the Clean Water Act.

As I am sure you realize, section 401 is the only mechanism by which a State can be assured that its water quality standards will be satisfied. We—that is the States—are the stewards of our rivers. We hold these rivers in public trust for the people of our respective States. We are the ones who are charged with planning comprehensively for their use and for assuring their improved quality. And we bear the risks and the consequences of all decisions, whether those decisions are made in Washington, D.C., or in places like Augusta, Maine.

To erode or to remove our ability to condition Federal permits or licenses where matters of our rivers are concerned would severely diminish our ability to participate in the decision-making process and would do the States—we believe—a grave disservice.

The State of Maine believes very strongly that where a State has made an effort to plan for the use and protection of its rivers, Federal decisions affecting those rivers should be consistent with those State plans, and that those decisions should show deference to State preferences over the different multiple uses of the rivers within their boundaries.

Thank you very much for your time and attention.

[The prepared statement of Mr. Silkman follows:]

PREPARED STATEMENT RICHARD H. SILKMAN, DIRECTOR, STATE PLANNING OFFICE, STATE OF MAINE

Senator Johnston, distinguished members of the Committee, my name is Richard Silkman and I serve as the Director of the State Planning Office of the State of Maine and as Governor McKernan's designee to speak for the State of Maine regarding matters concerning hydropower. I am before you today to provide you with Maine's perspective on the impacts of S. 341.

At the outset, let me summarize by stating that Maine enthusiastically supports S. 341 in its strengthening of the state role in regulating the development of small hydropower. However, we have a number of reservations about the aspects of the bill which concern 401 water quality certification.

Maine has a long history of harnessing water for power due to its abundant river systems and their suitability for the development of hydropower. The shape of Maine's river systems, the location of our historic factories and mills, and, today our cities are the result of over 200 years of water development.

As a result, the State of Maine has the dubious distinction of having more hydropower license expirations in 1993 than any other state in the nation. The Maine projects requiring relicensing represent 44% of our current indigenous hydropower capacity and 10% of the total electricity generation in Maine. We have long recognized the many advantages of hydropower as an energy resource. It is reliable, re-

newable, indigenous, and non-polluting. Indeed, the operational advantages of hydropower are many. It costs less per kilowatt hour than other forms of energy while having none of the deleterious impacts associated with fossil fuel combustion or nuclear generation. This is especially attractive in this era of concern about the health of our environment and especially concerns regarding global warming. It should not surprise you that we are especially concerned with measures which may affect hydropower development, water quality and our role in managing our waterways.

Therefore, the State of Maine enthusiastically supports the provision in S. 341 which eliminates the Federal Energy Regulatory Commission's jurisdiction over hydro projects of 1.5 MW or less. Maine is well prepared for self-regulation of small hydro. Indeed, we would argue that this provision does not go far enough. Where a state has demonstrated both the commitment and capacity to plan comprehensively for the use of its rivers, as is the case in Maine, the threshold for federal jurisdiction should be increased significantly, well beyond 1.5 MW, and federal jurisdiction exercised only in those instances where hydropower conflicts with navigation or creates multi-state impacts.

We are concerned in Maine that, for many reasons, hydropower has become a less attractive generation option over the past decade. During the early 1980's, available PURPA benefits and a period of rapid growth in Maine stimulated an unprecedented increase in small privately-owned hydropower plants whose sales contracts with the utilities were cost-effective and remain desirable in today's markets. However, low oil prices, correspondingly low avoided cost rates and changes in the Federal Power Act have made many previously attractive hydropower ventures no longer economically feasible. As a result, interest in the development of hydropower as well as other renewable and alternative energy resources has diminished. Despite this sagging demand for new hydro development, there are still potential opportunities in Maine for increasing the contribution of hydro to the energy supply. A study conducted by my office in 1989 found the potential for development of an additional 28 MW of small scale hydropower in Maine. Most of the projects included in this 28 MW figure are less than 1.5 MW and their development would be favorably affected by the enactment of S. 341. We welcome the possibility that, by lifting Federal regulation for projects 1.5 MW or less, small hydro development might experience a resurgence similar to that of the early 1980's.

The market conditions necessary to encourage hydropower development once again would involve high oil prices, attendant high fossil fuel indices and resultant high avoided-cost rates for public utilities. They might include, as well, renewed tax incentives and other incentives such as accelerated depreciation.

Our experience, however, is that economics is only a small factor in the development of hydropower. A much more important and generally more inhibiting factor is the regulatory process. The regulatory process is viewed by most developers as being cumbersome, expensive, duplicative, and highly uncertain, so much so that the process favors low capital cost/high operating cost power projects over hydro even through hydro projects often result in lower power cost over the life of the project. For many reasons, including the recent utility experiences with large, capital intensive projects, long-term benefits are being undervalued by the use of short evaluation periods, regulatory uncertainty, and high discount rates, while the long term risk of fuel price escalation and availability are not well treated.

Let me turn now to our concerns with water quality certification. The last two decades have seen dramatic improvement in the quality of the Nation's waters, in large part due to the efforts of the federal and state governments. A cornerstone of these efforts was the Clean Water Act which established, among other things, that conditions be provided for the preservation of fish, wildlife, and recreational opportunities on our rivers.

The legislation recognized, as well, the primacy of state authority in this effort. With respect to hydroelectric facilities, states exercise this authority through Section 303 and Section 401 of the Act. Section 303 requires states to develop water quality standards programs that protect multiple uses of water. Section 401 enables states to block the issuance of any federal license or permit involving a discharge into a state's waters unless that discharge complies with all applicable state water quality standards.

S. 341 effectively revokes the existing State authority to condition water quality certification under the terms of Section 401 of the Clean Water Act. By granting the authority to condition water quality certifications to the Federal Energy Regulatory Commission, this bill is a significant departure from the original intent of the Clean Water Act. The states are the parties with the investment, and thus bear the risk in the decisions regarding water quality. Because the states, as stewards of their own waters, are directly and generally solely responsible for planning for their waters, it

is consistent and appropriate that they also take responsibility for conditioning certification. The only mechanism by which a state can be assured that its water quality standards will be satisfied currently is through the Clean Water Act and the Section 401 water quality certification process. To erode that opportunity will do the states a great disservice.

The Federal Power Act mandates the Federal Energy Regulation Commission's role in the licensing of energy projects. It is the FERC's role to issue license or relicense decisions which promote balanced usage of a waterway in the context of the State and Federal agency consultation during the licensing process. In addition, it is the FERC's role to consider uses of the waterway based on state comprehensive planning and within the constraints imposed by state water quality standards. To diminish state authority for conditioning water quality certification minimizes the opportunity for the states to participate in the decisions regarding the balance of multiple uses of rivers. The State of Maine wishes to promote enactment of measures which affirm that states have discretion in exercising Section 401 authority to achieve, protect and maintain designated uses identified in state water quality standards. It is Maine's preference that granting states concurrent authority with the FERC for large scale hydropower projects be accomplished.

I believe that the origin of these proposed amendments to the Clean Water Act by Senator Johnston, derive from the question of whether consideration of water uses is appropriate in the 401 certification process. I am not here to argue this case today. However, the EPA has recently informed the FERC that states must look at more than strictly water chemistry when they process an application for a water quality certification at a hydroelectric project. It is the EPA's interpretation of the Clean Water Act that states are obligated to protect multiple uses of water and to address the multiple elements, "which together make up aquatic systems including the aquatic life, wildlife, wetlands and other aquatic habitat, vegetation, and hydrology required to maintain the aquatic system." (1) Accordingly if a state considers only water chemistry, it violates the congressional mandate to restore and (2) Correspondence from the United States Environmental Protection Agency to the Federal Energy Regulation Commission, January 18, 1991, p. 1 (SA at 39) maintain the chemical, physical, and biological integrity of the Nation's waters.

The State of Maine feels very strongly that, where a state has made an effort to plan for the use and protection of its own river resources, that Federal decisions affecting those resources should be consistent with those state plans. We feel strongly that, during Federal licensing proceedings, the Federal agencies should defer to the plans of the states. The states are the entities that live with the consequences of these decisions. Therefore, in cases where there is a conflict between the state's preference and a federal agency recommendation, deference should be given to the state's preference.

In concluding, I want to thank the Senate Committee on Energy and Natural Resources for the opportunity to speak to you today. It is no accident that Maine is appearing here to testify on the impacts of this bill. We are part of a region which is well endowed with hydropower resources yet which is very energy intensive and oil dependent. Therefore, matters of national energy policy, especially those pertaining to hydropower are of great concern to us. In addition, Maine is at the forefront on rivers policy, in this country, and out of necessity, Maine is a recognized leader in hydropower relicensing. We are committed in the hydro relicensing process to preserving as many inexpensive and indigenous kilowatt hours as possible within the constraints imposed by modern environmental standards. Our rivers have been and will continue to be critical to our economic and environmental health.

Senator BRADLEY. Thank you.

Mr. Echeverria.

STATEMENT OF JOHN D. ECHEVERRIA, VICE PRESIDENT AND CONSERVATION DIRECTOR, AMERICAN RIVERS, INC.

Mr. ECHEVERRIA. Thank you, Senator Bradley.

My name is John Echeverria. I am the vice president and conservation Director of American Rivers, a national river conservation organization. I appreciate the opportunity to testify today on the provisions of S. 341 dealing with non-Federal hydropower development.

I have submitted a written statement that is joined in by Friends of the Earth, National Audubon Society, Sierra Club, Trout Unlimited, The Wilderness Society, and the American Whitewater Affiliation. I would like to make four general points in my oral presentation.

First, from an environmental perspective, hydropower certainly has some advantages and we are the first to acknowledge them. On the other hand, hydropower development also has significant adverse effects on ecological, fish and wildlife, and recreational values that are of great importance to the American people. Hydropower has had—and continues to have—a particularly devastating effect on fisheries in the Pacific Northwest, the Northeast, and other parts of the country.

We believe the Nation's policy on hydropower must strike a balance that preserves outstanding, free-flowing rivers, and protects valuable ecological fish and wildlife and recreational resources. We believe proposed S. 341 would seriously upset the reasonable balance that exists today.

Second, the environmental cost that we, as a Nation, should be willing to incur as a result of hydropower development must depend, at least in part, on how much power we think we can obtain from that source in the future. This is a question of costs and benefits, after all. In our view, future hydropower development cannot make a significant contribution to this country's future energy needs. Hydropower, after all, is one of the oldest and most mature sources of power in this country.

As the Department of Energy said in a report issued just last month, many of the best sites for hydropower production have already been developed. Growth in hydropower has been slowing for several decades. And we can expect that trend to continue.

I have read the National Laboratories study which estimates the potential for future hydropower. I defy anyone in this room to explain that report or to explain how they got to those numbers. I have also read the 16,000 megawatt figure that is in the recently released National Energy Strategy Report. My testimony goes at some length into the various estimates that have been provided for future potential hydropower in this country. And I would just say that I think those estimates one, are highly uncertain, and two, I think those estimates are high.

But I think it is important, in looking at the question of—for example—the National Energy Strategy figure of 16,000 additional megawatts of power. Where are we going to get those 16,000 megawatts of additional power as a result of this strategy? Are we talking about building dams that the Fish and Wildlife Service, the National Marine Fishery Service, that the Forest Service, that the States would oppose? Or, are we simply talking about development that could occur because the process will be more efficient—that there will be unnecessary regulatory barriers, unrelated to environmental concerns, that will be taken down and magically will have 16,000 additional megawatts of power?

Frankly, I think if we take seriously the statement by Ms. Greely that the environmental protections will remain the same but we will get more power, those predictions of power are incredible. In other words, to get the figures that are being talked about, the

analysis must assume that it not only matters how many cooks you have, but who the cook is—in this case, the Federal Energy Regulatory Commission.

Thirdly, I believe the bill is not well crafted to achieve its stated goal, which I understand is to maintain the existing level of environmental protection, but to achieve a more efficient regulatory process. If that is the goal, I think the bill takes the wrong approach. It weakens significant protections—that is the ability of the States to protect their water quality; the authority of Federal fisheries agencies which have substantial expertise and experience in managing fisheries resources to determine when and under what conditions fishways should be installed; and the authority of Federal land management agencies, which, after all, are ultimately responsible for planning and managing for those lands the ability to prescribe conditions for the management of those lands.

I think the silence of the—the general silence of Mr. Underwood and Mr. Schmitten on the details of this bill speaks volumes about the attitude of the resource management agencies about the provisions of this bill.

On the other hand, this bill does not include any specific provisions to make the process more efficient without weakening environmental controls or the ability of resource management agencies to influence decision. In particular, the National Energy Strategy, in what I think is a hopeful initiative, focuses on the FERC consultation process, the 5-year-length process at the Federal Energy Regulatory Commission, which I think is the primary cause of regulatory delay and confusion.

This is the first point that the witness from the Department of Energy mentioned--the fact that the Department of Energy, that the Federal Energy Regulatory Commission gets into this process and identifies the needed studies only after the studies have been completed. That is the single-most important obstacle to reasonable hydropower development that this legislation should address and it does not.

Finally, I share with Mr. Silkman the concern about the proposed provisions dealing with section 401 which would limit State authority and subject State decisions under section 401 to a FERC veto. Last year the Supreme Court issued a decision—the Rock Creek decision—that severely limited State authority, particularly in the western United States, over hydropower and their ability to protect water resources potentially adversely affected by hydropower. This bill would essentially complete the evisceration of State authority over hydropower—not only for Western States, but for Eastern States as well.

We believe that the States, which are most familiar with the resources within their boundaries, and of the concerns of their local citizens, should continue to play a significant decision-making role when it comes to the development of their rivers for hydropower development.

Accordingly, the conservation organizations are opposed to sections 4201, 4202—and although I have not discussed the NEPA provisions, 10003.

Thank you very much for this opportunity to testify. I would be happy to work with the committee to elaborate on our comments,

to provide you any additional information, and to work with you to improve the legislation.

Thank you.

[The prepared statement of Mr. Echeverria follows:]

PREPARED STATEMENT OF JOHN D. ECHEVERRIA, VICE PRESIDENT AND CONSERVATION DIRECTOR, AMERICAN RIVERS, INC.

My name is John D. Echeverria. I am the Vice President and Conservation Director of American Rivers Inc., a national conservation organization dedicated to the protection and restoration of America's outstanding rivers. I appreciate the opportunity to testify today. I am submitting my testimony on behalf of American Rivers, Friends of the Earth, National Audubon Society, Sierra Club, Trout Unlimited, The Wilderness Society, and the American Whitewater Affiliation.

I will address sections 4201, 4202, and 10003 of S. 341, the National Energy Security Act of 1991, dealing with nonfederal hydroelectric development and compliance by the Federal Energy Regulatory Commission with the National Environmental Policy Act. Another section of the bill, section 4203, deals with potential hydropower development at existing Federal water facilities and American Rivers joins in the testimony being presented today on that provision by the National Wildlife Federation.

S. 341 proposes major changes in existing law relating to the regulation of nonfederal hydropower development. The bill proposes to narrow, and make subject to Federal oversight, the States' only significant remaining regulatory authority over hydropower. The bill also would eliminate the 70-year-old authority of Federal resource management agencies to impose mandatory conditions on hydropower projects to protect Federal land and fishery resources. The bill also would eliminate all Federal jurisdiction over projects with a capacity of less than 1500 kws. Finally, the bill would make unnecessary and harmful changes in the procedures used by the Federal Energy Regulatory Commission to implement the National Environmental Policy Act.

These proposed amendments would significantly weaken existing protections against new hydropower projects that have adverse effects on the environment. They also would seriously impede improvements in the operations of existing projects through the hydroelectric relicensing process. At the same time, contrary to their stated purpose, these provisions would not improve the efficiency of the regulatory process or make a significant addition to the nation's energy supply. The conservation groups therefore oppose the enactment of sections 4201, 4202, and 10003.

I. HYDROPOWER AND THE ENVIRONMENT

Hydropower development can have significant adverse effects on important ecological, fish and wildlife, and recreational values that are of great importance to the American people. Hydropower's deleterious effects on these values must be carefully weighed before the Congress seriously considers dismantling a regulatory program that has served the country reasonably well for a long time.

We acknowledge that hydropower has some distinct advantages as an energy resource. Some projects, particularly older projects, provide relatively inexpensive power. Hydropower operations produce no carbon dioxide or other air emissions and therefore do not contribute to national or global atmospheric pollution. Hydropower is a reasonably safe source of power. Accordingly, hydropower can and should contribute ever increasing amounts of electric power to this nation.

At the same time, some hydropower development can have devastating adverse effects on natural resources. Hydropower projects often produce major alterations of a stream's ecology, including alteration of natural stream flow, changes in water temperature, and inundation of wetlands and riparian areas.

Hydropower development also has adverse effect on fisheries of enormous commercial and recreational value to this country. According to the most recent comprehensive federal survey, there are over 46 million anglers in this country who, in 1985 dollars, expended in excess of $28 billion on fishing. The United States commercial fishery dependent on anadromous fisheries is worth many millions of dollars.

Hydropower development has destroyed and continues to destroy fish resources. In the Pacific Northwest, for example, impassable dams block access by salmon and steelhead to almost 5000 river miles in the Columbia River basin or approximately 30% of the original habitat area. Even where fish passage facilities have been installed, large numbers of anadromous fish are killed each year in their migration up

and downstream. The Northwest Power Planning Council estimates that declines in anadromous fish runs in the Columbia River basin due to hydropower development and operation range from 5 million to 11 million adult fish, out of an estimated decline from all causes of about 7 million to 14 million fish. Various stocks of Pacific Northwest salmonids are on the brink of extinction.

Similar impacts have occurred in other regions of the country. The Michigan Department of Natural Resources has calculated, for example, that dams block anadromous fish from using over 2000 mainstem river miles in that State. In New England, historic runs of salmon, shad, and alewives had been essentially eliminated from every major river system in the region until approximately 25 years ago. As a result of patient effort by the U.S. Fish and Wildlife Service, in cooperation with state fisheries agencies, some significant progress has begun toward restoring these fisheries in a few New England rivers, including the Penobscot, the Merrimack, and the Connecticut.

Hydropower development also constitutes a threat to the important scenic and recreational values of undammed rivers. According to figures compiled by American Rivers, approximately 17% of the river miles in this country already have been impounded by dams. Only a small fraction of riparian lands remain in a natural pristine state. While some hydropower projects provide certain recreational benefits, there also are sharp conflicts between hydropower development and recreation. Only about one percent of the river miles in the country provide high quality whitewater for recreational rafting and boating. These same sites characterized by steep river gradient—are often attractive for hydropower development. Commercial river outfitting businesses as well as private recreational boating, which are critically important to numerous local economies across the country, have been threatened by new hydropower projects.

In addition to our concern about the potential adverse effects of new hydropower development, the conservation groups are equally concerned about the continuing adverse effects of existing hydropower projects scheduled for relicensing. When Congress adopted the original Federal Water Power Act of 1920 it recognized that rivers are a public resource that must be managed in accordance with the public's changing needs and desires. Congress provided for private licenses with a maximum term of 50 years. At the end of the license term the Commission, federal resource agencies and the states must decide anew whether, by whom, and under what conditions the site should continue to be used for hydropower generation. When Congress enacted the Electric Consumers Protection Act of 1986, it recognized that these decisions must be made in light of today's environmental standards.

These older projects are generally operated with little or no regard for their adverse impacts on the environment. Let me cite just a few examples. The current operations of the Kingsley hydropower project, an existing project on the Platte River in western Nebraska, are causing serious damage to critical habitat for several Federal threatened and endangered bird species, including the whooping crane, bald eagle, and others. Dozens of dams, especially in the Northeast, the upper Midwest, and the Pacific Northwest, block or impede fish passage. At other projects, steps are needed to address pollution problems, to obtain scheduled dam releases to meet the needs of recreational and commercial rafters and boaters, and to improve public access to the river.

In the next year, applications for approximately 170 new licenses for existing hydroelectric plants will be filed with the Federal Energy Regulatory Commission and other agencies. Relicensing is not a cheap process, and in some cases project owners will be required to make substantial investments or make major changes in project operations to meet modern environmental standards. At the same time, virtually every project scheduled for relicensing will be relicensed, and in some cases project generating capacity will actually be increased after relicensing. On balance, the conservation groups believe the public benefits of the relicensing process far exceed the costs to project owners and consumers.

II. HYDROPOWER AND FUTURE ENERGY NEEDS

The second key issue Congress should address before it considers eliminating existing environmental protections is whether future hydropower development can actually make a significant contribution to meeting the nation's future energy needs. There is no reason to consider sacrificing important ecological, fish and wildlife, and recreation values in order to expand hydropower development unless future hydropower development can make a significant contribution.

In fact, regardless of the type of environmental controls imposed, the future hydropower development potential in this country is small. Whether the nation pro-

ceeds with appropriate hydropower development at a reasonable pace, or whether it launches a headlong rush to develop hydropower, the result will be largely inconsequential for the overall national energy picture.

Hydropower is one of the oldest and most technologically mature forms of electric generation. As a result, the best hydropower sites in this country already have been developed. As stated in the Department of Energy's January 1991 Electric Power Annual, Hydroelectric plants operate where suitable waterways are available; many of the best of these sites have already been developed." As mentioned above, American Rivers estimates that 17% of the total river miles in the United States have been impounded for hydropower and other purposes.

Over the last several decades, as the industry has matured, growth in the development of hydropower has declined significantly In the 1930's, hydropower generated fully 40% of the Nation's electric energy. Growth in hydropower capacity has been rapidly slowing, however, from 28,000 megawatts in the 1960's, to 18,000 megawatts in the 1970's, to 8000 megawatts in the 1980's. Significantly, this downward trend continued into the 1980's, even though Congress attempted in the early part of the decade to spur new development by providing substantial regulatory and tax encouragement for hydropower. Today, hydropower represents 12% of the nation's electric generating capacity and provides less than 10% of the nation's electrical energy.

Hydropower is likely to make a modest contribution to future energy needs. The Department of Energy commissioned a national laboratories study entitled "The Potential of Renewable Energy," dated March 1990, which examines the future potential of hydropower and other so-called renewables in meeting future energy needs. The study estimates that the contribution of hydropower will be in the range of 2.2% to 5.8% of the total potential contribution from renewables. As discussed below, there is strong reason to believe that the lower end of this range is the most realistic. In short, based purely on its ability to serve future energy needs, hydropower deserves far less emphasis than other sources of new power, including solar, wind, and geothermal.

The National Hydropower Association and others have suggested that the Nation's hydropower generating capacity could actually be doubled, or increased by as much as 76,000 megawatts. This estimate is a gross exaggeration of the realistic potential for hydropower. To be sure, any estimate of the nation's future hydropower development is speculative and depends significantly upon the assumptions used concerning prevailing energy prices and applicable environmental constraints. Nonetheless, the available evidence suggests that the reasonably achievable growth in hydropower over the next several decades in this country is extremely limited.

The allegation that the nation could double its hydropower generating capacity is based on a Federal Energy Regulatory Commission report entitled "Hydroelectric Power Resources of the United States," dated January 1, 1988, which contains a list of all the developed and "undeveloped" hydropower resources in the country. The report does indeed list 76,000 megawatts of undeveloped conventional hydropower capacity, roughly equal to the capacity of already existing resources. But this list of potential development sites is based on the most cursory surveys, with little or no analysis of the projects' engineering, economic, or environmental feasibility. Indeed, the report itself states that the figures presented should not be taken as estimates of the amount of new hydropower resources that actually could be developed:

> Most sites included in this report have shown indications of engineering feasibility. Some of them have evidenced economic feasibility as well. Many sites have not been analyzed in sufficient detail to evaluate their economic or environmental costs and benefits but are included to give an indication of the upper limit of the conventional water power potential of the United States. The estimates have been adjusted from previous years and will continue to be revised to reflect engineering, economic, or other changes as they occur. It should be recognized, however, that economic and other factors may preclude the development of *many* of the potential sites listed.

Hydroelectric Power Resources, at xxi (Emphasis added).

In fact, it appears probable that a large majority of the projects included in the report are infeasible. Many, apparently the majority, of the sites listed were at one time the subject of at least a preliminary application to the FERC but were never developed because of engineering, economic, environmental, or other problems. In other words, far from presenting a list of sites with actual development potential, the report consists in large part of failed and rejected projects that are unlikely ever to be built.

In the mid 1980's, the U.S. Army Corps of Engineers completed the "National Hydroelectric Power Resources Survey." This survey presents a significantly more

modest estimate of 2000 projects at new and existing dams with a total capacity of 46,075 megawatts. Significantly, the final report did not indicate that all of these projects were actually viable, but instead characterized them "as the best available candidates for future feasibility studies." It also is significant that at the time this report was published important Federal tax subsidies enhanced the financial viability of many potential hydropower projects.

More recently, the potential for hydropower development was evaluated in the national laboratories white paper "The potential of Renewable Energy." Appendix A to the report presents projections for the Nation's future hydropower potential. This appendix presents, under most scenarios, even lower estimates of the nation's conventional hydropower potential than either the 1983 Corps study or the 1988 FERC study. The report estimates that, between 1990 and 2030, assuming current energy and regulatory conditions remain the same, the nation's conventional hydropower capacity would increase by a mere 8000 megawatts.

Assuming the restraints allegedly imposed by ECPA could be minimized through an intensive research, development, and demonstration program, the hydropower contribution during this period would be 37,000 megawatts, still less than the figures in either the Corps or the FERC study. Only if it is assumed that a 2 cents/kilowatt subsidy were provided would hydropower development yield 54,500 megawatts of capacity.

It is difficult to assess or even comment upon the reliability of the national laboratories' estimates. Their analysis starts with the list of undeveloped projects presented in the 1988 FERC report; the deficiencies of that report have already been discussed. The derivation of the estimates of the different capacities that might be achieved under varying scenarios is explained in summary fashion without any explanation of the assumptions or calculation methods.

Other reports suggest that the achievable increase in hydropower capacity is even smaller. In July 1988, the Federal Energy Regulatory Commission published a report entitled "PURPA Benefits at New Dams and Diversions." The report focuses on new dam sites with a capacity of less than 100 megawatts, which represent approximately 15,000 megawatts out of the 76,000 megawatts of potential capacity identified in the 1988 FERC report. Of these 15,000 megawatts, the report concludes that only 1710 megawatts are financially feasible. Importantly, this figure assumes that the protections provided by ECPA would not be applied to these projects. More specifically, this figure assumes that development would take place on a number of a high quality streams that ECPA was designed to protect, including rivers declared off limits to hydropower development under State law, on rivers with anadromous fish runs or that support threatened or endangered species, gold medal and blue ribbon trout streams, and rivers identified in the National Park Service Nationwide Rivers Inventory as having outstandingly remarkable recreational value. If it is assumed these important resources are off limits to development the estimate of financially feasible new capacity is reduced to 690 megawatts.

These estimates, of course, only address smaller, new dam projects—only a portion of the total potentially developable hydropower resource base. It is obviously speculative to extrapolate the conclusions in the PURPA study to the entire universe of potential hydropower projects of all sizes at new as well as existing dams. Nonetheless, assuming the proportion of viable sites out of all the projects listed in the 1988 FERC report is the same as the proportion of viable sites out of the potential new dam sites with a capacity of less than 100 megawatts, the calculation yields an estimate of approximately 8500 megawatts of financially viable capacity. If ECPA environmental constraints were factored in, the figure would be even lower.

These estimates are in the same range as those recently developed by the Northwest Power Planning Council in its draft 1991 Northwest Conservation and Electric Power Plan for the Pacific Northwest. The Council's painstaking work to achieve a rational balance between the protection of river resources and appropriate energy development has been a model for the rest of the country and, therefore, the Council's estimates of achievable hydropower development are worthy of careful consideration. Based on a detailed analysis of technical, economic, and environmental constraints, the Council estimates the achievable supply of new hydropower in the Council's planning region at 1060 megawatts.

The Northwest Power Planning Council's estimate obviously encompasses only one region of the country. Significantly, however, the FERC 1988 report indicates that the undeveloped capacity in the "Pacific Northwest," which appears to be roughly equivalent to the Council's four-state planning area, is 21,422 megawatts, or roughly 20 times more than the Council estimates. If the Council's conclusion concerning the achievable portion of the potential hydropower capacity in the Pacific

Northwest is applied nationwide, the achievable capacity nationwide would be approximately 3000 megawatts.

In sum, these reports support two significant conclusions. First, the amount of new hydropower capacity that can realistically be developed in this country is highly uncertain, with authoritative government estimates varying by one or even two orders of magnitude. Second, the most detailed analyses suggests that the amount of achievable new capacity is low. This supports the conclusion that weakening environmental protections for hydropower would, under any circumstances, have little impact on the national energy picture.

III. THE PROPOSED LEGISLATIVE CHANGES

The Proposal to Weaken State Authority to Protect State Water Resources

Section 4201 would limit State authority under section 401 of the Federal Clean Water Act to prescribe conditions for hydropower projects and make State implementation of section 401 subject to a FERC veto. Section 4201(a) would, in effect, amend section 401 of the Clean Water Act by prohibiting States from imposing any requirement on a hydropower project not specifically related to the project's compliance with specified provisions of the Clean Water Act. Section 4201(b) would assign to FERC the power to declare ineffective any requirement imposed on a project pursuant to section 401 that the FERC believed exceeds State authority.

This proposed amendment conflicts with one of the fundamental purposes of the Clean Water Act—to strengthen State authority to protect State water resources. In general, section 401 provides that, whenever the Federal government issues a license or permit for a project that may result in a discharge into navigable waters, the proponent of the project must obtain a certification from the State that the project complies with State water quality requirements. Thus, section 401, like other provisions of the Clean Water Act, allows the States to be more protective of their water resources than the Federal government deems adequate. The proposed amendment contradicts the goal of strengthening State authority over water quality by seeking to narrow State authority under the Clean Water Act.

Furthermore, this proposed amendment would turn section 401 on its head. Another basic purpose of section 401 is to empower the States to make an independent review of the water quality impacts of Federally licensed or permitted projects. In the case of hydroelectric projects, the FERC determines whether or not to issue licenses for proposed projects and section 401 provides the States independent authority to decide whether or not the project meets State water quality concerns. FERC review of a State 401 decision would conflict with this purpose of section 401 by eliminating the independence of the State section 401 decision.

Finally, the proposed amendment represents bad policy because it would complete the evisceration of State authority over hydropower development. In May 1990, the U.S. Supreme Court ruled in the so-called "Roek Creek" decision, *California* v. *FERC*, 110 S.Ct. 2024 (1990), that the Federal Power Act preempts State authority to establish instream flows at FERC-licensed projects. Every other State in the Nation supported California's position that section 27 of the Federal Power Act preserves State authority. While the Supreme Court recognized the force of the States' position based on the language of the Act, the Court felt constrained to rule against California based on a poorly reasoned, 40-year old precedent. The Supreme Court's decision did not affect State authority under section 401, since the Clean Water Act is itself a Federal law and the Federal Power Act cannot preempt another Federal law.

However, section 4201 of S. 341 would take the Rock Creek decision one step further by sharply restricting State authority under section 401 and subjecting the States' decisions to Federal review. State officials are extremely knowledgeable about river resources in their States and their citizens' objectives for the management of these resources. Therefore, in our view, the States should continue to play a significant role in regulating hydropower development through section 401.

We understand that section 2401 is based on the perception that certain States may be exceeding their authority under section 401. In particular, in a June 5, 1990, report to the Subcommittee on Water and Power the FERC staff criticized certain State section 401 actions on the ground that they addressed fish, wildlife, vegetation and recreation concerns. In our view, the FERC staff position is incorrect. We believe the States are within the scope of their authority under section 401 when they act to protect the aquatic life, wildlife, wetlands and other aquatic habitat, vegetation, and hydrology required to maintain the aquatic system.

More importantly, the Environmental Protection Agency thinks so too. The Assistant Administrator of the Environmental Protection Agency, in a letter to FERC

dated January 18, 1991, attached as Exhibit A, rebutted the FERC staff report as well as other comments by the FERC staff on State implementation of section 401. The letter explains the broad range of factors that a particular State may address under section 401, and describes the goal of the Clean Water Act to leave broad authority to the States to address water quality concerns. We believe that on the question of whether the States are properly interpreting section 401, the views of the Environmental Protection Agency, the government department charged with implementing the Clean Water Act, should receive substantial consideration.

The Proposal to Eliminate the Authority of Federal Land Management Agencies to Protect Federal Lands

Section 4202 (a) and (b) of S. 341 would eliminate the existing authority of the Secretaries of the Interior and Agriculture to set terms and conditions for hydropower projects located on Federal reservations under their jurisdiction. Section 4(e) of the Federal Power Act provides that FERC licenses for projects located on Federal reservations [1] shall be subject to and contain such conditions as the appropriate Secretary deems "necessary for the adequate protection and utilization" of the reservation. The proposed amendment to the Federal Power Act would convert the Secretaries' determinations into mere recommendations.

The section 4(e) conditioning authority was included in the original Federal Water Power Act of 1920. It has existed for over 70 years, and has been retained through several comprehensive revisions of the Federal Power Act over the years including, most recently, the Electric Consumers Protection Act of 1986. The section 4(e) authority has withstood the test of time. There is no good reason to adopt this radical change in the Federal Power Act.

It would be illogical for the managers of the Federal lands not to have a direct say concerning hydropower on Federal lands. The Federal land management agencies obviously understand the lands under their jurisdiction and the competing demands for their use. Through their local offices, these agencies work closely with citizens and local government officials in determining how best to manage these lands. By contrast, the FERC staff, headquartered in Washington D.C., who sometimes will never even have seen the project they are licensing, has little knowledge of the resources or the effect of a proposed project on other uses of the Federal lands.

If anything, the argument for a decision making role for the Federal land management agencies is more compelling today than it was 70 years ago. During the deliberations over the Federal Water Power Act of 1920, Congress debated, much as it is debating today, whether and how different agencies should exercise regulatory authority over hydropower. In 1920, Congress resolved the debate in favor of giving the Federal land management agencies mandatory conditioning authority. Since 1920, Congress, through a number of different pieces of legislation, has expanded the multiple use responsibilities of these agencies. For example, pursuant to the National Forest Management Act and the Federal Land Policy and Management Act, both the Forest Service and the Bureau of Land Management prepare detailed plans for the management of Federal lands for a wide variety of public uses. The agencies responsible for creating these plans should play an important role in determining whether the proposed construction and operation of a hydropower project are consistent with the terms and objectives of these plans.

The Proposal to Eliminate the Authority of Federal Fisheries Agencies to Require the Construction of Fishways

Section 4202(e) of S. 341 would eliminate the authority of the Secretaries of Interior and Commerce under Section 18 of the Federal Power Act to prescribe the construction of fishways at FERC-licensed hydropower projects. Like the authority of the land management agencies to prescribe mandatory conditions under section 4(e), this authority has been included in the Federal Power Act since 1920. Again, absent compelling justification, and we are aware of none, this time-tested provision should not be modified.

The authority to prescribe fishways at hydropower projects complements the responsibility Congress has assigned the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to restore and manage the Nation's depleted anad-

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[1] The Federal Power Act defines Federal reservations broadly to mean "national forest, tribal lands embraced within Indian reservations, military reservations, and other lands and interests in lands owned by the United States, and withdrawn, reserved, or withheld from private appropriate and disposal under the public land laws; also, lands and interests in lands acquired and held for any public purpose; but shall not include national monuments or national parks."

romous fisheries. Pursuant to the Anadromous Fish Conservation Act, for example, the Federal fisheries agencies, in cooperation with the States, conduct extensive studies of anadromous fisheries and the obstacles to their restoration and protection, construct and operate fish hatcheries, and carry out strategies for clearing obstacles to fish migration, including the design and construction of fishways. These agencies have the primary responsibility for establishing the basic plan for restoring anadromous fisheries to their former habitat. As Congress recognized 70 years ago, the authority to prescribe the design and timing of construction of fishways at non-federal hydropower projects is an essential tool for these agencies to carry out their missions.

The Federal fisheries agencies also should retain the authority to prescribe fishways because they are the only Federal agencies with the necessary expertise concerning the design and installation of fishways. The science of fishway design is a complicated one that depends heavily on expertise developed through many years of practical experience. The Federal fisheries agencies have developed the necessary expertise. By contrast, we understand that the FERC, at present, does not have a single fish facility engineer on its staff. It would take many years for the FERC to begin to develop expertise in this area that would begin to match that of the Federal fisheries agencies.

Finally, and perhaps most importantly, the Federal fisheries agencies should retain their section 18 authority because they have exercised that authority in an extremely moderate and reasoned fashion. In general, the agencies have only exercised their authority under section 18 on those rivers where restoration goals are most likely to be achieved at the most reasonable cost. Further, the agencies carefully time the requirement to construct fishways to ensure that money is not spent unnecessarily before there is a biological necessity for the installation of fishways. In other words, the Federal fisheries agencies do not blindly pursue the goal of fish restoration, but rather balance a number of factors, including the value of the fishway from a resource perspective and the financial impact on the owner of the project, before deciding where, when, and under what terms to direct the construction of fishways.

The use of section 18 authority in connection with the salmon restoration effort in New England illustrates the point. At one time, every major river system in New England supported teeming runs of salmon and other anadromous fish. Dam construction and other factors destroyed these runs. Over the last twenty-five years, the U.S. Fish and Wildlife Service has focussed its resources almost exclusively on the Connecticut, the Penobscot, and, more recently, the Merrimack. On the other hand, the Service has deferred taking action on certain other major rivers where large numbers of dams will make restoration more difficult. The Service, generally in close cooperation with State fisheries agencies, is in the process of developing restoration plans for certain other rivers. These plans project the gradual installation of fishways in concert with the growth of the fisheries over the course of several decades, and these plans will be periodically reviewed to ensure that the investments in fishways are useful and reasonable.

Finally, even though the Federal fishery agencies' prescriptions are free from FERC review, the agencies do not have unfettered discretion. The fisheries agencies' prescriptions are subject to Court review under the arbitrary and capricious standard. This provides an additional assurance that the Federal fisheries agencies will take all relevant factors into account in exercising their section 18 authority.

The Proposal to Eliminate Federal Authority Over Small Projects

Section 4202 (d) and (f) of S. 341 would eliminate Federal jurisdiction over projects with a capacity of less than 1500 kws. This proposal appears to be based on the mistaken premise that there is an insufficient Federal interest in small hydropower projects to justify Federal involvement.

It is certainly correct that projects below this threshold make an inconsequential contribution to the nation's energy supply. But these smaller projects can and do have important adverse effects on resources of Federal concern, particularly migratory fisheries. To cite one example, in Maine 6 projects with a capacity of 1500 kws or less represent the first and most important barrier to upstream fish migration on six different rivers including the Kennebec River, the Sebasticook River, the Ossippee River, the Presumpscot River, the Little Androscoggin River, and Marsh Stream.

There is no necessary relationship between the size of a project and its effects on the environment. For example, a large multi-purpose water project with extensive impacts can be fitted with a relatively small generator. Also, as illustrated by the example of the Maine rivers, a small hydropower project can just as easily cut off

migratory fish habitat as can a large project. A small project also may have significant impacts if it is located at a sensitive site, such as endangered species habitat or a highly scenic waterfall. Finally, depending on its mode of operation and the stream affected, a small project can significantly affect upstream lake levels and alter downstream river flow, degrading the health and character of a river for miles downstream.

Projects with a capacity of 1500 kws or less represent a significant fraction of the total number of FERC projects. In Michigan, for example, these smaller projects represent 29% of the total number of projects under FERC jurisdiction. In Wisconsin, they represent 31% of the total. A quick survey of a portion of a list recently prepared by the National Hydropower Association of preliminary permits in effect at the Commission showed that 75 of 200 proposed projects had a capacity of 1500 kws or less.

Under this proposed amendment, the States would, of course, remain free to regulate these smaller projects. But, in the absence of FERC involvement, neither the U.S. Fish and Wildlife Service nor the National Marine Fisheries would have authority to review the projects. Furthermore, most States lack the experience and institutional capacity to take on comprehensive responsibility for regulating hydroelectric development, even projects limited to less than 1500 kws. It is questionable whether most States would develop the expertise to deal with this category of projects. At a minimum, it would take a number of years for States to develop the capacity to take on this new responsibility.

Finally, this proposed amendment would have the negative effect of encouraging fragmented river management. Already, too little attention is paid to the cumulative effects of multiple hydropower projects in individual river basins and to the preparation of comprehensive river plans to ensure that whole rivers are developed and managed in the broad public interest. When the Commission and other agencies evaluate proposed hydropower projects they should do so in relation to other existing and proposed projects in the river basin. Eliminating Federal jurisdiction over smaller projects would discourage this comprehensive approach.

Eliminating Federal jurisdiction over smaller projects would have a particularly unfortunate adverse effect on fish restoration efforts. Where multiple dams block fish migration a coordinated regulatory approach is essential. However, if some of the hydropower dams on the river were under Federal jurisdiction while others were under exclusive State jurisdiction, the difficulties of achieving a successful restoration would become that much greater. This might be a very real issue, for example, on the St. Joseph River in Michigan or on the Saco River in Maine, where small projects with capacity of less than 1500 kws, along with other larger projects, impede upstream salmon migration.

Finally, the proposed exemption would encourage "gaming" of the regulatory process. Proponents of hydropower projects would have an incentive to increase or reduce the size of their proposed project in order to obtain the most favorable forum. Also, it would be difficult to police efforts to obtain authorization to construct a project from the State based on small project capacity when in fact the long-term plan is to construct a larger capacity project that might not be approved, or might be approved subject to different conditions, if it were initially presented to Federal agencies for their review.

The Proposal to Designate FERC as the Lead Agency for NEPA Compliance

Section 10003(a) of S. 341 would designate FERC as the "lead agency" for the purpose of preparing environmental review documents under the National Environmental Policy Act for the construction or operation of projects or facilities under the Federal Power Act as well as the Natural Gas Act. In addition, this amendment would authorize the Commission to set time limitations for consultations with other Federal agencies and deadlines by which these agencies must complete their reviews and submit comments to the Commission.

This provision is unnecessary and unwise. Section 1501.5 of the NEPA Guidelines prepared by the President's Council on Environmental Quality establishes a clear procedure for identifying the lead agency to supervise the preparation of an environmental impact statement. This procedure, including the opportunity for dispute resolution by the Council, is adequate to resolve any dispute that may arise concerning the lead agency for review of a hydropower project. So far as we are aware, no other Federal agency has been statutorily designated as the lead agency for any particular class of projects and we see no justification for taking this unprecedented step in the case of the Commission.

We also object to the language of section 10003(a) that would authorize the Commission to establish time limitations on the participation of other agencies in the

preparation of NEPA documents. The Guidelines of the President's Council on Environmental Quality do not authorize any Federal agency to establish such deadlines. In our view such deadlines would be inconsistent with the mutually respectful and cooperative approach that should characterize Federal agency joint participation in the preparation of an Environmental Impact Statement. Any disputes that arises between cooperating agencies in preparing an environmental review document can and should be resolved by the Council on Environmental Quality.

It should be recognized that, compared to all other Federal agencies, the FERC has one of the worst records for implementing the National Environmental Policy Act. The Commission was one of the last Federal agencies to adopt regulations implementing the NEPA Guidelines of the Council on Environmental Quality. The Commission continues to rely too heavily on Environmental Assessments, rather than Environmental Impact Statements, minimizing public involvement in the environmental review process. Given this history, there is no justification for granting FERC a special exception from NEPA procedures that are applicable to all other Federal agencies.

Proposal to Allow Third Party Funding of Environmental Documents

Section 10003(b) would direct the Commission to allow applicants, at their option, to elect to have a contractor, consultant, or other third party prepare an environmental document for their project. It also would provide that such person would be chosen by the Commission in its sole discretion and would direct the Commission to promulgate rules to avoid financial or other potential conflicts of interest.

The conservation groups have strong reservations and serious questions about this provision. We regard the preparation of appropriate NEPA documentation as an important governmental function and we are troubled by the idea that obtaining government action on an application should depend on an applicant's ability and willingness to pay for a service that otherwise would be funded by the public. We also are concerned that, regardless of the types of safeguards that might be adopted through rulemaking, there is a strong appearance of and high potential for actual conflict of interest where a contractor paid by the applicant is charged with analyzing the environmental consequences of the applicant's proposed project. In addition, we are concerned that this provision would divest the FERC of authority to itself prepare an environmental document if it wished to do so in a particular case contrary to the wishes of the applicant. Finally, we are concerned that the already extensive delegation of NEPA responsibilities to outside contractors has undermined the morale of FERC staff and discouraged the development of expertise on various resource subjects on the Commission staff. Yet further delegation might exacerbate these apparent problems.

Some of the questions we have include the following. Would an applicant have the option to withdraw his election for a consultant once he learned the identity of the consultant? Would the applicant be required to advance the full costs of preparing the environmental document to avoid the possibility that the applicant could threaten to withhold payment? Would the applicant pay the contractor directly or would the applicant pay the Commission who would in turn pay the contractor? Does the statement that "The contractor shall be chosen by the Commission in its sole discretion" mean that the Commission's selection of a contractor would not be subject to review? Would the intent of this provision be better captured by stating that "the contractor shall be chosen solely by the Commission?" Would the Commission not only choose the contractor but would it also be the direct and sole supervisor of the consultant's work?

In summary, we believe it makes little sense to destroy important ecological, fish and wildlife, and recreational values with the goal of accelerating hydropower development. It makes even less sense given the small energy contribution future hydropower development can make to the nation's future power needs. We urge the Committee to delete sections 4201, 4202, and 10003 from S. 341.

[Attachment.]

[Exhibit A]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,
OFFICE OF WATER,
Washington, DC, January 18, 1991.

Hon. LOIS D. CASHELL,
Secretary, Federal Energy Regulatory Commission, Washington, DC.

DEAR MS. CASHELL: I am writing on behalf of the Environmental Protection Agency's (EPA) Office of Water to help clarify issues regarding the application of Clean

Water Act Section 401 state water quality certification to Federal Energy Regulatory Commission (FERC) licenses. This letter was precipitated by FERC documents addressing Section 401 certification: a letter of July 25, 1990, to James Elder, Director, Office of Water Enforcement and Permits, from Fred Springer of your staff; and portions of a June 5, 1990, Report of the Staff of the Federal Energy Regulatory Commission to the Water and Power Subcommittee of the U.S. Senate Energy and Natural Resources Committee.

The FERC report (page 4) asserts that state Section 401 certification conditions on FERC licenses related to "fish, wildlife, vegetation and recreation" are inappropriate. However, protection of water quality involves far more than just addressing water chemistry. Rather, protection of water quality includes protection of multiple elements which together make up aquatic systems including the aquatic life, wildlife, wetlands and other aquatic habitat, vegetation, and hydrology required to maintain the aquatic system. Relevant water quality issues include the toxicity and bioaccumulation of pollutants, the diversity and composition of the aquatic species, entrapment of pollutants in sediment, stormwater and nonpoint source impacts, habitat loss, and hydrologic changes. A State may need to address any one or combination of these factors in particular circumstances in order to meet the mandates of the Clean Water Act (CWA) articulated in Section 101(a) "to restore and maintain the chemical, physical, and biological integrity of the nation's waters."

State water quality standards form the backbone for formulating Section 401 decisions. EPA regulations (40 Part 131) implementing Section 303(c)(2)(A) of the CWA require that States adopt water quality standards having three basic components: use designations, criteria to protect those uses, and an antidegradation policy. EPA regulations direct that, where attainable, States must designate uses to meet the CWA goal in Section 101(a)(2) of water quality which "provides for the protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water." States must develop criteria designed to protect and maintain these designated water uses. States are not limited to adopting chemical-specific criteria, but are exhorted to adopt narrative and numerical criteria (40 CFR 131.11(b)). In addition, EPA's Fiscal Year 1991 Operating Guidance provides that by September 30, 1993, all States are to adopt biological criteria into their water quality standards. EPA regulations also require that States adopt antidegradation policies providing for protection of existing uses and the level of water quality necessary to maintain those uses. In the case of fill activities in wetlands, existing use requirements are met if the activity does not cause or contribute to significant degradation of the aquatic environment as defined in the guidelines developed under Section 404(b)(1) of the CWA.

In its letter, FERC expressed concern that States may be imposing conditions in hydropower licenses which go beyond EPA water quality standard requirements. As we explained above, water quality standards go well beyond chemical-specific criteria. In addition, Section 510(1) of the CWA expressly reserves the right of States to adopt or enforce "(A) any standard of limitation respecting discharges of pollutants, or (B) any requirement respecting control or abatement of pollution" that are equal to or more stringent than Federal standards or limitations. If a State imposes conditions or denies certification beyond the bounds of its authority, such conditions or denials may be challenged through the State administrative and judicial system.[1]

The FERC letter inquires about EPA's authority to limit State Section 401 decisions. As noted earlier, States have the authority to impose more stringent environmental standards. In addition, EPA's authority under Section 401 is limited. While EPA approves State water quality standards and, if necessary, promulgates Federal water quality standards, we do not have the authority to countermand State Section 401 certification decisions. The only exception is that EPA regulations (40 CFR Section 114.55(c)) provide for EPA to disregard State certification conditions or certification denials when the grounds for the decision Is that State law allows a less stringent permit condition. Under Section 401(a)(1), EPA has authority to conduct Sec-

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[1] We acknowledge some divergence in State Court decisions interpreting Section 401 certification authority. Compare *In re Lava Diversion Project*, 717 P. 2d 1274 (Ore. App. 1986) (allowing consideration of State land use planning in the State's 401 certification conditions) with *Fourth Branch Associates* v. *Department of Environmental Conservation*, 550 N.Y.S. 2d 769 (Albany Co., 1989) (limiting State certification decision to whether project will violate water quality standards). These decisions, however, were reached without any consideration of the views of EPA, the primary Federal agency responsible for implementation of the CWA. In any case, Section 401(d) of the CWA gives the States authority to place any conditions on water quality certification that are necessary to assure that the applicant will comply with effluent limitations, water quality standards, standards of performance, or pretreatment standards (Sections 301, 302, 303, 306, and 307 of the CWA) and with "any other appropriate requirements of State law."

tion 401 certification decisions in cases where the State does not have the authority. For example, EPA issues certifications for South Dakota and for some Indian Tribes. In addition, Section 401(a) gives EPA specific responsibilities for notification and recommendations in cases where a discharge may affect the waters of any State other than the State in which the discharge originates.

EPA has issued, and will continue to issue, guidance and technical assistance for States to use in developing water quality standards and in implementing their Section 401 programs. Guidance on implementing water quality standards is included in EPA's Water Quality Standards Handbook. Recently, EPA issued program guidance on biological criteria (April 1990), and guidance on water quality standards for wetlands (July 1990). In addition, EPA is developing sediment criteria guidance and biological effects-based testing procedures for contaminated sediments, revisions to the water quality standards regulation, and other guidance as needed. In April 1989, we issued a handbook for States on the application of Section 401 certification to wetlands. Finally, as the principal agency responsible for administering the CWA, EPA routinely communicates its interpretation of statutory provisions such as those under Section 401 to State and Federal agencies.

I hope that this letter has clarified EPA's position on the broad range of elements that States need to include in their water quality standards to protect the quality of the nation's waters, the application of these and other considerations in Section 401 certification, and EPA's role in the certification process. If you have any questions regarding this letter or wish to meet to discuss water quality issues as they relate to your agency, please call me or have your staff contact Martha Prothro, Director, Office of Water Regulations and Standards (382-5400).

Sincerely yours,

LAJUANA S. WILCHER,
Assistant Administrator.

Senator BRADLEY. Thank you very much, Mr. Echeverria.

Mr. Conrad.

STATEMENT OF DAVID R. CONRAD, WATER RESOURCES SPECIALIST, NATIONAL WILDLIFE FEDERATION

Mr. CONRAD. Thank you, Mr. Chairman.

My name is David Conrad. I am water resources specialist for the National Wildlife Federation. We appreciate the opportunity to testify to the committee.

Mr. Chairman, hydropower is one of our most mature and heavily developed energy resources. Most of the best sites are already utilized. And undeveloped, small sites are unlikely to make a significant contribution from a national energy perspective, under current and foreseeable economic circumstances.

I included at the end of my testimony some tables or some graphics that have been produced by the Federal Energy Regulatory Commission to show that, in fact, one of the greatest constraints to hydropower right now is price—is the price of energy. And if energy prices do rise, I think we will see some more hydroelectric power. But the suggestion that has been made is that the whole problem is regulatory. And I do not think that is a particularly fair reading.

So much is at stake. The ratepayers and the taxpayers in the Pacific Northwest are committing about $1 billion to try to restore their salmon fisheries to a slightly more respectable level. But hydroelectric power projects in the headwaters of the streams in the Pacific Northwest, or in the main stems, could have a terrifically deleterious effect. And I think that is the point that the National Marine Fisheries Service witness was trying to make—that there is a great deal at stake here. And the concept built into the bill to eliminate the fish passage prescription authority of the National

Marine Fishery Service, that is the heart and soul of their ability to be involved in this process. So we join with the other conservation groups in opposition to that proposal.

We also oppose language in the bill that would severely restrict the authority of States to carry out their water-quality certification responsibilities. The amendment would turn the State-certification process into a sham by allowing the Federal Energy Regulatory Commission to second-guess what is needed. We do not believe it should be the role of the commission to make water-quality decisions for States.

Mr. Chairman, the Federation also strongly opposes the elimination of section 4(e), Conditioning Authority, as proposed in the bill. The Federal Energy Regulatory Commission is not the most appropriate agency to determine conditions to best protect and utilize the Nation's public lands and reservations and the natural resources that they harbor.

We also strongly oppose the language in the bill that would eliminate Federal Power Act jurisdiction as it relates to power projects equal to or less than 1.5 megawatts. That class represents 33 percent of the power projects up for relicensing in the next 10 years, for instance.

As proposed, in the bill, the deregulation would eliminate a host of important public interest safeguards in the statute, which I have listed on page 5 of my testimony. One can envision a chaotic situation that might ensue with passage of this provision as it is drafted. Because States do not have analogous regulatory systems in place.

Aside from Maine and Oregon, which do have excellent systems that they have put together, most of the other States do not yet have something to take over if there was a summary deregulation. And I think that is a serious problem with what has been proposed in the bill.

In particular, Mr. Chairman, I was asked to talk about the studies.

Senator BRADLEY. Okay.

Mr. CONRAD. We view the studies in section 4203 as an open invitation to pork-barrel development that fails to require analysis of environmental and other relevant factors. Any authorization for such studies should require non-Federal financing for the studies, establish new, more realistic pricing requirements for federally generated hydropower, and require evaluation of current environmental concerns regarding the facilities and any environmental effects that would likely accompany new capacity.

Without the environmental information that we are suggesting, we see that the studies would be of little practical use. And I think that was confirmed by what Mr. Underwood said, for instance, in his testimony.

The Federal power marketing agencies have historically marketed federally generated power at rates that are well below market rates—and even fall short of recovering the taxpayers' investment. The energy conservation and efficient use of water by Federal water and energy conservation—the underpricing of power has worked fundamentally to discourage energy conservation and efficient use of water by Federal water and power customers. If S. 341

is to represent an answer to the Nation's long-term energy needs, it should price Federal hydropower realistically.

Regarding one of the provisions—we support the increase of water-use efficiency at Federal projects, which would make more water available for hydroelectric generation and other purposes. Since much federally generated hydroelectric energy is used to pump water for irrigated agriculture, it is critically important to identify these opportunities.

The Bureau of Reclamation, however, has statutory responsibility under section 210 of the Reclamation Reform Act to encourage responsible water conservation measures in the operations of non-Federal recipients of Federal Reclamation projects.

I would like to provide for the record a report that came out this month from our organization called Gathering Dust: The Bureau of Reclamation's Failure to Enforce Statutory Water Conservation Requirements.

If the Bureau of Reclamation did take its water conservation requirements seriously, it would both benefit the western States as far as water supply was concerned, and it probably also would have positive benefits regarding energy.

Finally, we also oppose the legislated lead-agency status in the bill for the Federal Energy Regulatory Commission. We believe it is neither wise nor necessary under NEPA regulations to legislate that status. FERC, in our opinion, has the worst NEPA compliance record of any Federal agency. And we do not believe that record merits legislated, primary authority status.

Mr. Chairman, weakening the roles of States, Federal land managers, and fishery agencies in hydroelectric licensing is no guarantee of additional generation. What is known is that the marginal projects that would be coaxed into development by these proposals would come at significant environmental cost. We believe the primary constraint on hydropower is not regulation at this point, but energy prices. The high surrender rate that Mr. Hunt referred to—two-thirds that are licensed do not get built.

That point, I think, is especially evidence of the fact that the market just is not supporting the projects. It is not regulation.

Senator BRADLEY. Mr. Conrad, we have to——

Mr. CONRAD. So thank you, Mr. Chairman. And I will be glad to answer any questions.

[The prepared statement of Mr. Conrad follows:]

PREPARED STATEMENT OF DAVID R. CONRAD, WATER RESOURCES SPECIALIST, NATIONAL WILDLIFE FEDERATION

My name is David R. Conrad. I am a Water Resources Specialist with the Water Resources Program of the National Wildlife Federation. I appreciate the opportunity to present the views of the Federation on the portions of S. 341 pertaining to hydroelectric power regulation. The National Wildlife Federation is the nation's largest conservation organization with more than 5.8 million members and supporters and 51 state and territorial affiliate organizations. Because of the profound and significant environmental impacts often associated with hydroelectric power development, the Federation has been an active participant in numerous Federal Energy Regulatory Commission (FERC) hydroelectric power licensing and rulemaking proceedings. The Federation was also actively involved in the development of the 1986 Electric Consumers Protection Act, which made important and much needed reforms to the hydroelectric licensing program.

I would like to make a few general comments about the status of hydroelectric power before detailing the Federation's specific concerns about S. 341. First, hydropower is one of our most mature and heavily developed energy resources. Most of the best large sites are already utilized, and undeveloped small sites are unlikely to make a significant contribution from a national perspective under current and foreseeable economic circumstances. I have included two graphic displays from FERC studies as attachments to this testimony to help illustrate this point.

Existing hydropower projects, on the other hand, have been among the largest causes of damage to the nation's commercial, sport, and native fisheries, have drowned hundreds of scenic canyons, and are a major focus for river and fishery restoration programs in several regions. Northwest taxpayers and ratepayers are committing the equivalent of $1 billion in direct investments and foregone power benefits in attempts to double depleted salmon fisheries in the Columbia River basin. In New England, restoration of Atlantic salmon to about a dozen streams has already cost $111 million and the Fish and Wildlife Service estimates additional costs to the public and private sector of more than $200 million over 30 years. In each of these regions the conditions attached to hydroelectric relicensing and original licensing proceedings can have significant effects on the future success of these investments. What's more, huge amounts have also been committed to water quality improvements that can be seriously undermined by poorly sited or designed hydropower projects.

So much is at stake that we believe the legitimate, substantive roles for the states, Federal land managers, and natural resource agencies in Federal hydropower regulation must be guarded and maintained. S. 341 would severely and unnecessarily weaken environmental protections for hydropower projects.

The Federation strongly opposes language included in the bill that would eliminate the key environmental responsibilities of the states, Federal land management agencies, and fish and wildlife agencies with regard to hydroelectric licensing.

Section 4201—Section 401 Certification. The Federation opposes language in section 4201 that would severely restrict the authority of states to carry out their water quality certification responsibilities under the Clean Water Act regarding hydroelectric power projects. The effect of the language would be to fundamentally weaken the Clean Water Act in two ways, by——

Curtailing states' conditioning authority with regard to their own water quality laws (401(d) authority); and

Allowing the Commission to void any state certification condition, if the Commission believes the condition is "not needed" to meet the state's water quality standards.

The bill would profoundly harm states' ability to establish and achieve the designated uses in their water quality standards, and negate their responsibilities under the Clean Water Act. It is a basic premise of the Clean Water Act that states have the duty and responsibility to develop water quality standards at least as stringent as those required by Federal law, and to achieve them. Federally licensed or permitted projects must adhere to state standards. Far from any "streamlining" of the licensing process, section 4201 would allow FERC to remove states and their priorities from licensing altogether.

This amendment would also turn the state certification process into a sham by allowing FERC to second guess what is "needed". Under the Clean Water Act, the jurisdiction to review matters regarding state water quality standards is delegated to state courts and the Environmental Protection Agency. It is difficult to imagine what the review process would be when the Commission begins to void state conditions. Furthermore, we do not believe it should be the role of the Commission to make water quality decisions for states. We strongly object to this provision.

Section 4202, entitled "Streamlining of Federal Power Act Regulation" constitutes a frontal assault on the Federal Power Act's most basic environmental protection provisions, which have been in place for more than 70 years.

Elimination of Section 4(e) Conditioning. Subsection 4202(a) of S. 341 would eliminate the authority of Federal land managers to set hydropower license conditions "for the protection and utilization" of reserved public lands occupied by hydropower projects. These areas include national forests, Indian reservations, military lands, wildlife refuges, certain BLM lands, and other lands. The 4(e) conditioning powers were firmly upheld by the Supreme Court in the *Escondido* decision in 1984.

In the mid 1980's, at the height of the "small hydropower" gold rush, Federal public lands were beset with an onslaught of get-rich-quick hydropower site speculation. Since there is no land cost associated with developing projects on public lands, these areas have attracted high developer interest. By 1984-85 there were more than 750 hydropower license and permit applications pending on national forests alone.

Most of these projects were not pursued, due to their high cost and the failure of energy prices to escalate as many developers had hoped. In California, Oregon, Washington, and Idaho, national forest managers foresaw, however, that if even a modest percentage of projects went forward, major damage would result to fisheries and other public use and enjoyment of the forests.

It is the Federal Power Act's section 4(e) conditioning authority and the land management planning process that are the key to avoiding the chaotic development of public lands. While huge numbers of projects were proposed with high potential for environmental damage, most were of such small generating capacity as to represent a virtually meaningless contribution to national energy supply, far out of proportion to the adverse effects involved.

The Federation strongly opposes the elimination of section 4(e) conditioning authority as proposed in the bill. The Federal Energy Regulatory Commission is not the appropriate agency to determine the conditions to best protect and utilize the nation's public lands and reservations and the natural resources they harbor.

Subsection 4202(e)—Repeal of Section 18 Fishway Prescriptions. The Federation also strongly opposes the repeal of the Federal Power Act's section 18 authority for the Secretary of the Interior and the Secretary of Commerce to prescribe fishways for licensed hydroelectric power projects. This prescription authority and responsibility has been vested with the Federal fishery agencies from the original passage of the Act in 1920. It is a principal authority upon which most of the nation's often decades-long anadromous fishery restoration projects are predicated.

The effect of this repeal would be to subordinate fishery protection and restoration to hydroelectric power generation—no matter how marginal—with the Commission firmly established as the ultimate decider of what fishery protection and restoration can and will be accomplished. The expertise in design and review of fish passage measures is located in the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. Second guessing these agencies on these matters is not an appropriate role for the Commission. We strongly oppose this provision of the bill.

Subsections 4202 (d) and (f)—Elimination of Federal Power Act Applicability to Projects of 1500 KW (1.5 MW) Power Production Capacity or Less. The Federation also opposes the language in Sections 4202 (d) and (f) to eliminate Federal Power Act jurisdiction as it relates to power projects equal to or less than 1.5 MW. This class represents 33% of the 227 projects scheduled for relicensing in the decade of the 1990's and probably a higher percentage of proposed projects that have come before the Commission in recent years.

For years, the idea has been floated to deregulate small hydropower projects, mostly on the theory that there is no Federal energy interest in projects of such insignificant size. There is often little relationship, however, between the generation capacity of hydroelectric projects and their potential for significant environmental impact. For example, the 1.5 MW Winchester Dam, a FERC-exempted project in Oregon, was approved over the strong objections of the National Marine Fisheries Service and a local fishing group. The project's operation resulted in significant kills of both upstream and downstream migrating salmon, as predicted by NMFS. Ultimately the 9th Circuit Court of Appeals reversed FERC's project approval, the purchasing utility bought out the power contract, and the developers agreed to remove the turbines and generators. Another project in California that has engendered some of the most heated environmental controversy over fishery flows has only 900 KW of planned capacity.

As proposed in the bill, deregulation would eliminate:

The mandatory conditioning authority of Federal land managers for projects on reservations;

The prescriptions for fish passage by Federal fishery agencies;

The authority of states to certify to state water quality standards;

The requirements of National Environmental Policy Act (NEPA) compliance in many circumstances;

The requirement that projects be "best adapted to a comprehensive plan" for river basin development;

The requirement that environmental factors must be given equal consideration with development purposes;

Limited license terms for the use of public waters; and

The government's receipts from falling waters charges for benefits provided by government dams,

to name just a few of the implications. We are aware of only two states with anything close to comprehensive hydropower licensing statutes analogous to the Federal Power Act that would allow for an orderly transition, if such a deregulation

measure were adopted. One can envision a chaotic situation that might ensue with passage of this provision as it is drafted.

It should be recognized that Congress in 1980 enacted a Federal "exemption" for hydropower projects of 5 MW or less with an extremely short and simple application form. Also, FERC regulations contain a significantly shorter license form for small hydropower projects. Further, it is unclear that deregulation would result in any more hydroelectric energy.

While we agree that the Federal interest is minimal in the energy generation of small hydropower projects, there are strong Federal interests in their environmental aspects. We do not support hydropower deregulation without an accompanying statutory requirement to maintain current Federal and state environmental controls.

The proposal to direct the Secretary of Energy to study opportunities for improving the efficiency and capacity for hydropower generation at existing Federal facilities is an open invitation to pork barrel development that fails to require analysis of environmental and other relevant factors.

Mr. Chairman, Section 4203 would authorize the Secretary of Energy, in consultation with the Secretary of the Interior and the Secretary of the Army, to identify "cost-effective" opportunities to increase hydropower production and improve energy and water-use efficiency at existing Federal water projects. Any authorization for such studies should——

Require non-Federal financing of such studies;

Establish new, more realistic pricing requirements for Federally generated hydropower; and,

Require evaluation of current environmental concerns regarding the facilities and any environmental effects that would likely accompany capacity increases.

The Committee is presumably aware of the large numbers of studies and reports that have been generated regarding hydroelectric development at Federal facilities. The Corps of Engineers, Bureau of Reclamation, river basin commissions, states, and agencies like the Northwest Power Planning Council have conducted numerous hydropower investigations in recent years, both programmatic and site specific. Uprating and rewinding of generators is already underway or completed at many Bureau of Reclamation and Corps hydropower projects. The Bureau's FY 1992 budget shows upratings and rewindings for at least a dozen of its power dams. In addition, FERC has received non-Federal hydroelectric applications for developments at many Federal facilities with numerous licenses having been issued.

We would expect the information sought in the bill's study authorization would be of little practical use without the analysis of environmental factors and other water uses that may be affected. The primary criticism leveled at broad hydroelectric surveys conducted by the FERC, DOE, and the Corps since the mid-seventies has been the lack of analysis of environmental impacts and economic feasibility. The Committee should direct that any "preliminary assessments" of costs should also include identification of expected mitigation costs and an economic feasibility analysis based on realistic markets and prices for power.

The Federal power marketing agencies have historically marketed Federally-generated power at rates that are well below market rates and even fall short of recovering the taxpayers' investment. The underpricing of power has worked fundamentally to discourage energy conservation and efficient use of water by Federal water and power customers. If S. 341 is to represent an answer to the nation's long term energy needs, it should price Federal hydropower realistically. It should be clear in this legislation that both studies for hydropower expansion and new capacity development should be fully financed by the beneficiaries.

We support the increase of water use efficiency at Federal projects, which would make more water available for hydroelectric generation and other purposes. Since much Federally-generated hydroelectric energy is used to pump water for irrigated agriculture, it is critically important to identify opportunities to increase the efficiency of agricultural water use and use of Federally-marketed power. The Bureau of Reclamation has statutory responsibility under section 210 of the 1982 Reclamation Reform Act to "encourage the full consideration and incorporation of prudent and responsible water conservation measures in the operations of non-Federal recipients of irrigation water from Federal reclamation projects", but the agency has failed to do so. We offer for the Committee's record a National Wildlife Federation report issued this month, entitled "Gathering Dust—The Bureau of Reclamation's Failure to Enforce Statutory Water Conservation Requirements", which details these failures. Any additional conservation authority should require evaluation and implementation of a broad range of water and energy conserving opportunities, including reducing or eliminating water and energy subsidies, innovative pricing

mechanisms and cost-recovery, opening and broadening of water markets, and encouraging increased water conservation through removal of barriers to water marketing.

It should be noted that efforts are currently underway to correct environmental problems at Glen Canyon Dam and the Upper Colorado River Basin projects, and the Columbia/Snake River and CVP-Sacramento River projects. These studies will probably result in operational changes that will reduce environmental impacts by moderating flow fluctuations caused by peaking-power operations or altering of seasonal flow patterns.

The proposal to legislate mandatory NEPA lead agency status for FERC and to require third party contracting is unwise and unnecessary.

Section 10003(a)—Mandatory lead agency status. By statute, subsection 10003(a) would establish "lead" agency status for FERC for all NEPA compliance regarding construction or operation of facilities under the Natural Gas Act or the Federal Power Act, and would allow the Commission to set mandatory time limits for NEPA activities. It would make FERC the "primary authority" for NEPA compliance in these areas. The Federation opposes such a legislated designation because we believe it is neither wise nor necessary under NEPA regulations to legislate this status. Such a designation would also be unprecedented since NEPA was enacted.

In our view the Commission has probably the worst NEPA compliance record of any Federal agency. FERC was the last Federal agency to adopt the Council on Environmental Quality NEPA regulations, after years of resisting criticism by Congress, CEQ, others in the Executive branch, and the courts. FERC has consistently sought to avoid early NEPA involvement with license applicants and the public. In order to limit and avoid the broader public participation envisioned by the CEQ regulations, the agency continues to implement NEPA almost exclusively with environmental assessments of projects for which other agencies would automatically prepare environmental impact statements. And while it averaged only 2 environmental impact statements per year in the 1980's, virtually all prepared by outside contractors, many of these have been given insufficient or inadequate ratings by the Environmental Protection Agency. We do not believe FERC's record of compliance merits a legislated "primary authority" status.

More importantly, we oppose the amendment because it would remove the flexibility built into the CEQ NEPA regulations that encourages Federal agency cooperation while maintaining the independent utility of NEPA documents by the agencies. The amendment would establish the Commission as NEPA czar, allowing it to set mandatory time schedules for any aspect of NEPA procedures, potentially deviating from the standards set in the CEQ NEPA regulations.

While we have serious problems with the proposed legislation, there are recent positive signs that the Commission is responding to the widespread concern that its NEPA procedures should be coordinated with other Federal agencies. The CEQ NEPA regulations (40 CFR 1501.5) already encourage the Commission to assume the lead role or to work jointly with other agencies. Last October, the Commission and the Forest Service prepared their first "joint" environmental assessment for a proposed hydropower project on national forest lands, shortening the process and reducing paperwork. Others are under preparation. If the Commission simply follows the CEQ regulations that it has adopted, improvements will result in processing times for license applications.

Third party contracting. Subsection 10003(b) would require FERC to allow applicants to contract with third parties to prepare any environmental documents in connection with Natural Gas Act or Federal Power Act cases. We believe that this amendment poses serious problems and conflicts with current environmental law. Under the CEQ regulations, FERC can allow third party contracting to assist in NEPA compliance, but it is not mandated. Under section 10003, the Commission or a cooperating Federal agency may be constrained from developing NEPA documents on their own instead of using a third party contractor. Because considerable controversy surrounds third party contracting, we believe it is wise to maintain FERC's discretion in this area. We understand the Commission is seeking guidance from CEQ on third party contracting, and is considering the possibility of trial projects without legislation.

Further, the amendment is not limited to NEPA, but refers to any "environmental document", and fails to require direct agency involvement in scoping. An additional effect of the amendment as drafted could be to remove the Fish and Wildlife Service's authority regarding third party contracting for preparation of an endangered species consultation document. This would not be a provision we could support.

CONCLUSION

Weakening the roles of states, Federal land managers, and fishery agencies in hydroelectric licensing is no guarantee of additional generation. What is known is that the marginal projects that would be coaxed into development by these proposals would come at significant environmental cost. We believe the primary constraint on hydropower at this time is not regulation, but energy prices. The high surrender rate of licenses already issued in 1983-84 period is good evidence of that.

We strongly urge the Committee, to reject the proposals in S. 341 to weaken environmental protections in hydroelectric licensing. We recommend instead that:

Planning efforts by the Commission and natural resource agencies should be accelerated to anticipate any new hydropower development that may result from future energy price rises;

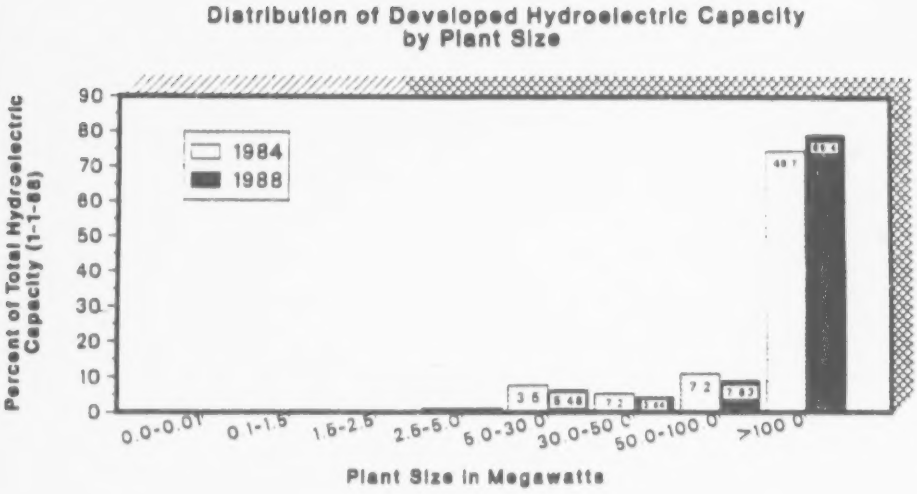
Regional energy and environmental planning, as done by the Northwest Power Planning Council, should be required for other Federal power marketing areas;

A carbon tax should be imposed to reflect environmental costs associated with fossil fuel combustion. This would improve the competitive position of some currently marginal hydropower projects, without sacrificing environmental safeguards;

A substantial preliminary permit fee should be required that would reduce the workload at FERC and other resource agencies caused by speculators who file on multiple sites with little intention to actually develop projects themselves;

The Commission should be encouraged to fully incorporate the NEPA process early, during prefiling consultation, as intended in the CEQ NEPA regulations. This could cut a year or more from some license proceedings; Adequate funding should be provided for FERC and fish and wildlife agencies to meet the relicensing workload, including needed research funds for instream flow studies, fish turbine mortality studies, and fishery and aquatic habitat studies, especially for the eastern United States.

Mr. Chairman, I appreciate the opportunity to present the Federation's views on the hydropower licensing provisions of S. 341. I would be glad to respond to any questions.



Note Numbers in Bars Represent Capacity in Gigawatts in That Size Category

FIGURE VII

Source: Hydroelectric Power Resources of the United States
Developed and Undeveloped
Federal Energy Regulatory Commission
January 1, 1988

Source: PURPA Benefits at New Dams and Diversions
Final Staff Report Evaluating Environmental and Economic Effects
FERC, July 1988
2-6

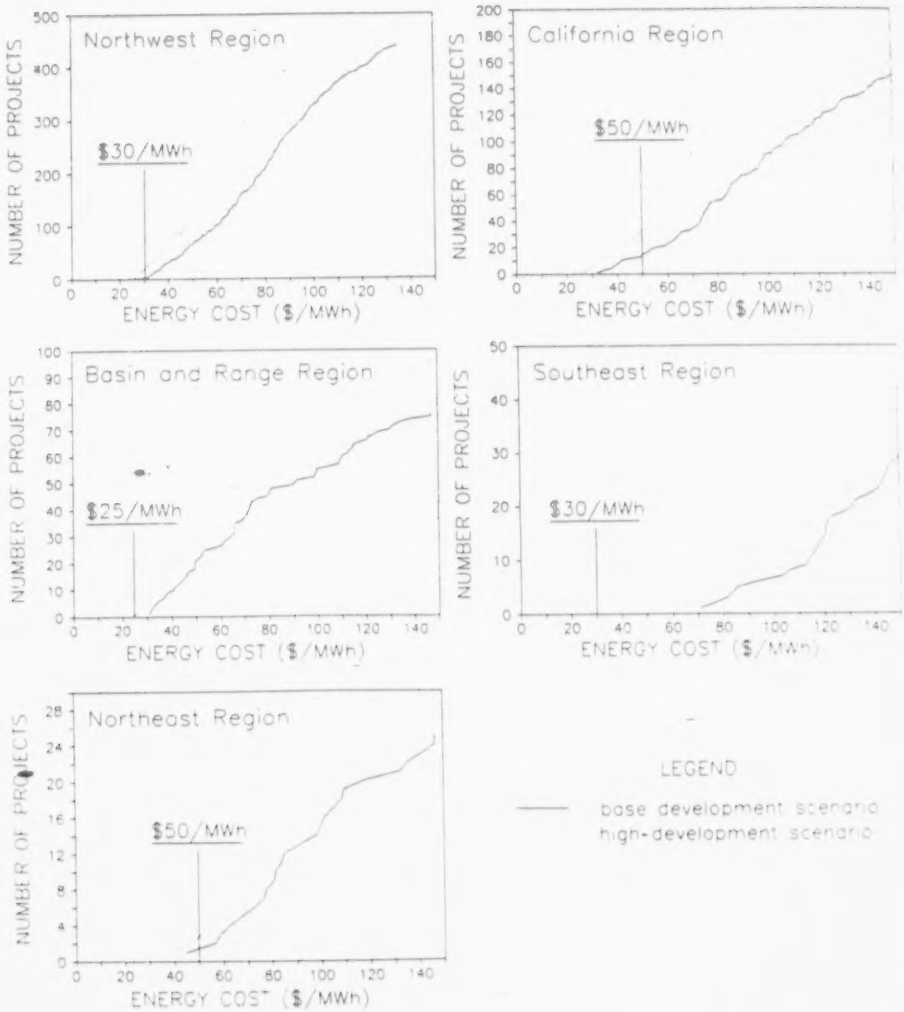


Figure 2-2. Regional hydroelectric supply curves at new dam and diversion projects and the short-run marginal energy cost thresholds defining viable hydropower projects under alternative 1 (see Appendix C for details.)

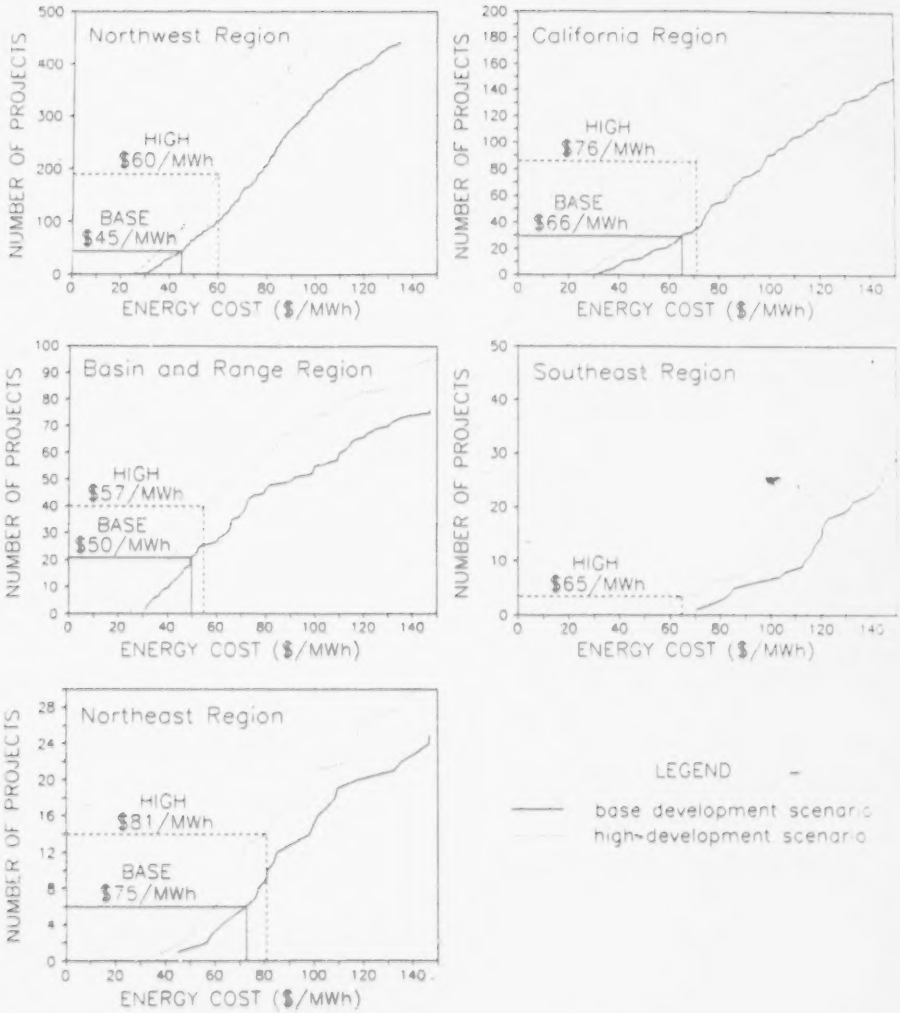


Figure 2-3. Regional hydroelectric supply curves at new dam and diversion projects and the full avoided-cost thresholds defining viable ECPA-affected hydropower projects under alternatives 2 and 3 (see Appendix C for details).

Gathering Dust

The Bureau of Reclamation's Failure to Enforce Statutory Water Conservation Requirements

February, 1991

Water Resources Program
National Wildlife Federation

Edward R. Osann, Director
Tom Howard and John Cain, Principal Researchers

PREFACE

The Bureau of Reclamation, the agency charged with constructing and delivering water from federal irrigation projects in 17 Western states, has shrunk from its responsibility to reduce the waste of water and promote conservation in the arid West. In spite of a Congressional directive, a serious drought, and its 1987 pledge to improve management of existing facilities, the Bureau is not requiring irrigation districts to develop and carry out effective water conservation plans.

The current drought in the West lends urgency to water conservation efforts. Urban consumers follow water rationing and scheduling, and pay emergency prices in several metropolitan systems.[1] Even after this drought ends, population growth will continue to expand urban demands for water. Yet the age of giant water projects to meet unlimited demands has drawn to a close. The best dam sites have been taken, and developing others would be too expensive or environmentally destructive. The main components of the West's water delivery system are now in place, and its operators will have to learn to use this finite supply with greater foresight and ingenuity.

Saved water is often the least expensive source of new supplies. A mere 5% savings from the 40 million acre-feet of water the Bureau devoted to agriculture in 1987 would have yielded two million acre-feet, enough to support the domestic needs of about four million households for a year.

In 1982, after decades of controversy over the nonenforcement of the acreage limitation and residence requirement imposed on recipients of federally subsidized irrigation water, Congress passed the Reclamation Reform Act. The RRA raised the acreage limit for each recipient of subsidized irrigation water from 160 acres to 960 acres. The Act also required water districts served by the Bureau to prepare water conservation plans. The law gave the districts directions regarding the contents of such conservation plans. The plans were to contain "definite goals," "appropriate measures," and "time schedules" for compliance.

During the years following passage of the RRA, the Bureau slowly promulgated rules, regulations, and guidelines concerning conservation plans, eventually setting July 1, 1987, as the deadline for submitting them. By December 31, 1987, some 87% of the districts that were required to file

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[1] The San Francisco Water Department, the Santa Clara Valley Water District, the Los Angeles Department of Water and Power, and the Metropolitan Water District of Southern California.

plans had done so, and the Commissioner of Reclamation found the results to be satisfactory. However, by February 1989, nearly 10% of the districts required to file plans still had not done so.

The National Wildlife Federation has reviewed a representative sample of these plans, and we find it difficult to share former Commissioner Duvall's satisfaction. Our review of 43 plans turned up two, perhaps three, plans that could reasonably be said to have met the basic requirements of the RRA. The rest of the plans in our sample are in varying states of noncompliance, ranging from earnest but flawed efforts down to curt off-the-cuff statements about as long as a business letter.

The National Wildlife Federation review found that the Bureau has placed the water conservation plan requirements of the 1982 Act at the very lowest level of priority during the last eight years. The Bureau has not required water districts to set quantitative goals for conservation, which alone could lend rigor to the plans, and save billions of gallons of water. The Bureau's guidelines to the districts on preparing plans confuse matters by blurring the distinction between ends and means in water conservation. The Bureau has accepted statements of good intentions in lieu of the detailed plans the RRA requires. The RRA sets out criteria for conservation plans, but the Bureau, by accepting plans that patently fail to meet these criteria, is failing to enforce the law.

The National Wildlife Federation has a special interest in water conservation, because water savings in irrigation contribute directly to preserving fish and wildlife habitat, reduce contamination from irrigation run-off and drainage, halt pressures to build new dams and diversions, and develop additional water supplies to lessen the effects of droughts.

Diversions of scarce water resources for agriculture have left important wetlands and riparian habitats without sufficient water to sustain fish and wildlife populations. Moreover, alarming concentrations of salts, selenium and toxic metal in water drained from agricultural lands across the West is poisoning remaining habitat and degrading drinking water supplies. Agricultural water conservation is considered the most cost effective means of mitigating irrigation drainage[2] and water supply problems.[3]

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[2] M. Caswell, E. Lichtenberg, & D. Zilberman, "The Effects of Pricing Policies on Water Conservation and Drainage," *American Journal of Agricultural Economics*, November 1990, Vol. 72, No. 4, pp. 883-890.

[3] Marc Reisner and Sarah Bates, *Overtapped Oasis*, Washington, DC, Island Press, 1990, pp. 112-115.

As a minimal first step toward dealing effectively with water shortages and habitat destruction, the Bureau must accept the water-conservation program envisioned in the RRA as a major element of the agency's mission. As long as irrigation water continues to be heavily subsidized, prescribed water conservation programs, not price, will be a necessary mechanism for conserving water and allocating it efficiently. Regulatory measures must do the job until the Bureau reforms its pricing, allocation, and environmental policies. If the Bureau takes steps to enforce the conservation provisions of the RRA properly, the limited water supplies of the arid West will be extended, and fish, wildlife, and people will greatly benefit. Conversely, without more effective implementation of the law, meaningless water conservation plans will continue gathering dust.

NWF recommends that the Bureau of Reclamation:

- rewrite and strengthen its water conservation requirements setting a goal of at least 10% water savings over the next ten years;

- promote markets for water that will enable its irrigation customers to profit from conservation;

- modify its pricing policies to eliminate unwarranted subsidies to irrigation water users;

- devote a portion of saved water to fish and wildlife restoration efforts; and

- apply conservation techniques to quickly reduce the threat to water quality from contaminated irrigation drainwater.

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LOCATIONS OF IRRIGATION DISTRICTS IN SAMPLE

LIST OF DISTRICTS IN SAMPLE

REGION		CONTRACTING AGENCY	PROJECT
Mid-Pacific	1	City of Lindsay	CVP (Friant-Kern)
	2	Carpinteria County W. D.	Cachuma
	3	Centinella W. D.	CVP (Delta-Mendota)
	4	Clear Creek Community Services Dt.	CVP (Shasta-Trinity)
	5	El Dorado I.D.	CVP (Sly Park/Folsom)
	6	Exeter I.D.	CVP (Friant-Kern)
	7	Fresno I.D.	CVP (Friant-Kern)
	8	Glenn-Colusa I.D.	CVP (Sacramento)
	9	Truckee-Carson I.D.	Newlands
	10	Westlands W.D.	CVP (San Luis)
	11	Solano I.D.	Solano
	12	Maine Prairie W. D.	Solano
Upper Colorado	13	Orchard Mesa I.D.	Grand Valley
	14	Grand Valley Water Users' Assn	Grand Valley
	15	Ogden River Water Users' Assn	Ogden River
	16	Ephraim Irrigation Co.	Sanpete
	17	Horseshoe Irrigation Co.	Sanpete
	18	Weber Basin Water Conservancy Dt.	Weber Basin
	19	Uintah Water Conservancy Dt.	CUP (Vernal)
	20	Pine River I.D.	Pine River
	21	Uncompahgre Water Users' Assn	Uncompahgre
	22	Strawberry Water Users' Assn	Strawberry Valley
Missouri Basin	23	Shoshone/Heart Mtn I.D.s	Shoshone
	24	N. Colorado Conservancy D.	Colorado/Big Thompson
	25	Pathfinder I.D.	North Platte
	26	Midvale I.D.	Riverton PSMB
	27	Lower Yellowstone I.D.'s 1 & 2	Lower Yellowstone
	28	Belle Fourche I. D.	Belle Fourche
Lower Colorado	29	Imperial I.D.	Boulder Canyon
	30	Coachella Valley W. D.	Boulder Canyon
	31	Salt River Valley Water Users' Assn	Salt River
	32	Welton-Mohawk I. & D. Dt.	Gila
	33	Yuma County Water Users' Assn	Yuma
Southwest	34	Elephant Butte I. D.	Rio Grande
	35	Arch Hurley Conservancy Dt.	Tucumcari
	36	Hidalgo & Cameron Co. I.D. #9	Lower Rio Grande
Pacific Northwest	37	A & B I. D.	Minidoka-Palisades
	38	American Falls Reservoir Dt. #2	Minidoka-Palisades
	39	Black Canyon I. D.	Boise
	40	East Columbia I.D.	Columbia Basin
	41	Minidoka I.D.	Minidoka-Palisades
	42	Quincy-Columbia I.D.	Columbia Basin
	43	Roza I. D.	Yakima

I. IRRIGATION AND DEVELOPMENT OF THE WEST[4]

The history of the Bureau of Reclamation explains many of the reasons why it has not required irrigation districts to adopt effective water conserving measures.

Western irrigation in the 19th Century

A spokesman for the Bureau of Reclamation claimed recently that federally subsidized irrigation is responsible for much of the character of the Western U.S.[5] The claim is partly true. It is not true, however, that the Bureau created the irrigated West. This distinction goes to the Spanish in California and the Mormons in Utah, and to their imitators in many western river valleys throughout the second half of the nineteenth century. In all the years of its existence the Bureau has brought water to eleven million acres--a large area, to be sure, but not dramatically larger than the eight million acres already irrigated through local efforts in 1902, the year the Bureau was established. Local efforts have continued; today, the 11 million acres served by Bureau water account for only 20% of irrigated land in the West.[6]

The "irrigation movement," i.e., the demand for federal support for irrigation, did not become a major political force until the very last years of the nineteenth century, and was a sign that sites for irrigation projects that would provide a return to private enterprise were already taken.

Birth of the Bureau

The Reclamation Service (Bureau of Reclamation after 1923) was established by Congress in 1902 in order to promote economic development in the arid West by expanding the area of irrigated farming.[7] The reclamation program, it was claimed, followed in the tradition of the

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[4] Sources for Bureau history are Stanley Davidson, *The Leadership of the Reclamation Movement 1875-1902*, history dissertation, 1956, University of California, Berkeley; Mark Reisner, *Cadillac Desert: the American West and Its Disappearing Water*, 1986; Wallace Stegner, *Beyond the Hundredth Meridian*, 1982; and William E. Warne, *The Bureau of Reclamation*, 1985.

[5] Letter from Wayne N. Marchand, Assistant Secretary of Interior for Water and Science, to Rep. George Miller, February 2, 1988.

[6] Repetto, Robert, *Skimming the Water: Rent-Seeking and the Performance of Public Irrigation Systems*, Research Report #4, World Resources Institute, 1986, page 6.

[7] Reclamation Act of 1902, 32 Stat. 388, 43 U.S.C. § 371 *et seq.*

Homestead Act and other legislation designed to dispose of the public land in a way that would foster family farms.

The concept that beneficiaries of a Bureau of Reclamation irrigation project must repay the costs of the project has always been basic to the program, in theory. Beneficiaries were not, however, expected to repay the interest. This subsidy, the first of many to follow over the years, was thought to be justified by the benefits that would reach large numbers of people and so spark economic development in regions of the country that would otherwise remain "unimproved." To ensure wide distribution of benefits, the law set a limit of 160 acres on the amount of land that one owner could irrigate with water from a Bureau project, and required owners to live on or near their irrigated farms. These provisions were intended to discourage land speculation and the assembly of large tracts in single ownerships.

The Bureau's early years

During its first three decades, the Bureau made an impressive record in engineering and construction. Its dams were often state-of-the-art, the largest built at that time. A term of service with the Bureau provided a kind of post-graduate education for many American engineers.

The actual utility of many Bureau structures proved less impressive. Private enterprise had already claimed the best sites, and for political reasons the Bureau was not free to choose objectively among those that were left. Because of pressures to spread its efforts evenly around the 17 Western states, projects had to be undertaken in places where the soil was not fertile enough, or the growing season not long enough, to create anything like the dreamed-of cornucopia. As discussed above, Reclamation farmers were expected to repay the capital costs of the projects serving them, although they were exempted from payment of interest, the largest part of the costs.

Widespread failure to meet the original 10-year repayment period led to the Reclamation Extension Act of 1914, which lengthened the repayment period to 20 years. Even this much time proved to be too short for many farmers. The Reclamation Project Act of 1939 granted a ten-year moratorium on any repayment, to be followed by a 40-year repayment period. Meanwhile, Congress passed several acts during periods of agricultural hard times that granted total or partial relief of debts to many projects, including Uncompahgre (one of our sample) in 1931.

Thus the irrigation subsidy grew and grew, becoming part of the economic underpinning of selected areas of Western agriculture. During the New Deal years, the revenues from Bureau hydroelectric projects began to be used to assist in repaying costs above the ability of irrigators to pay. This assistance was another clear indication that irrigation investment was no longer expected to pay its own way.

The Bureau and the New Deal

Franklin Roosevelt's strategy for dealing with the Great Depression was the beginning of the Bureau's golden age. Federal spending was used as a stimulant to the economy. But this time, the benefits were not tied to the return on a project as much as to the pump-priming effect of simply spending the money on it. Employing hundreds of workers on giant construction projects was thought to be a good in itself.

During the 1930's and 1940's the Bureau undertook its largest projects, such as the Central Valley Project[8] and the Columbia Basin Project. The Bureau's boom years continued through the quarter century after World War II, when giant undertakings like the Colorado River Storage Project, the Pick-Sloan Missouri Basin Project, and the Central Arizona Project were initiated. Bureau employment peaked in 1950 at 19,261. (It is now 7,200.)

The acreage limitation debate

The Bureau took its mission to impound and divert water much more vigorously than its mission to distribute the water to promote family farming. It administered the 160-acre limit ineffectively and indifferently, allowing powerful individuals and corporations to assemble irrigated farms vastly larger than Congress had intended.

The Bureau's dereliction in enforcing acreage limitations was one of the longest-running political scandals in the West. Proponents justified irrigation subsidies with a vision of agrarian populism, to be secured by limiting the acreage that could be held by one person. One might expect, therefore, that as the subsidy was expanded, efforts to keep benefited lands in small holdings would become stronger, but the exact opposite was the case. Not only did the subsidy get bigger, but the average reclamation farm did as well.

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[8] The State of California created the Central Valley Project, but was unable to sell enough bonds to finance it. The Federal government (with Harold Ickes as Secretary of the Interior) then took it over. Reisner, *supra* note 1 at p. 10.

In 1976, National Land for People, a California family farm activist group, successfully sued the Bureau over the acreage limit. As a result, the Bureau proposed rules to enforce the limit and sell excess land at reasonable prices. Irrigation interests in California's Central Valley blocked these rules by filing a suit of their own, claiming that an environmental impact statement was required first. The maneuver backfired when the statement substantiated claims that there was widespread violation of the acreage limit in the Central Valley. All these events helped pave the way for the Reclamation Reform Act of 1982. (The content of this legislation is discussed in section III below.)

The Bureau amidst new realities

Over the period of the Bureau's existence, the nation's understanding of irrigation has changed. Despite talk of a new mission, the Bureau has been unresponsive to the economic and environmental problems associated with water in today's West.

> [The] water policies and programs which fostered western development in the first half of this century are having negative effects on the region under the water scarcity conditions prevalent in the 1980's. By insulating some water users from the increasing value of the the resource, other users and potential users find it more difficult and costly to fulfill their needs. Administration of federal water projects as well as state water laws and policies not only allow an inefficient use of western water, they often ensure inefficiency by reducing or eliminating the incentives and opportunities for transferring water to higher-value uses.[9]

Urban water supplies have been tapped beyond their dependable yield in a long term drought. Consumers follow water rationing and scheduling, and pay emergency prices in several metropolitan systems.

Fish and wildlife have had to make do with less as well. Dams and diversions caused the loss of hundreds of thousands of wetlands and thousands of miles of riverine and riparian habitat. Remaining wetlands often don't receive enough water to support fish and wildlife populations at their present level. For instance, in California's Central Valley where 60% of the waterfowl on the Pacific Flyway winter, the U.S. Fish and Wildlife Service estimates that its refuges have a firm water supply of only

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[9] K. D. Frederick and J. C. Hanson, *Water for Western Agriculture*, 1982, p. 232.

9 1/2% of the water necessary for successful wintering by waterfowl.[10] The fall run of the chinook salmon in the Sacramento River has been listed as endangered and the striped bass population in the Sacramento/San Joaquin Delta is at an all-time low.

Many remaining wetland habitats are being poisoned by polluted agricultural drainage. Excessive irrigation has leached a toxic brew of naturally occurring salts, minerals, and metals from the West's arid and marginal lands. This problem first gained public attention when the death of thousands of waterfowl at Kesterson National Wildlife Refuge in California was attributed to high concentrations of selenium in irrigation drainage water. Dangerous concentrations of salts, metals and other minerals are poisoning wetlands and rivers across the West[11] and degrading important water supplies like the Sacramento/San Joaquin Delta and the Colorado River.[12]

Contamination of agricultural water supplies with saline irrigation drainage water threatens to reduce the West's agricultural capacity. Irrigation with poor quality, saline water can reduce crop yields and in some cases render valuable agricultural lands useless for agriculture.[13] Resources for the Future reports that an estimated 25% - 35% of the irrigated lands in the West have salinity problems, and the problems are worsening.[14]

An inter-agency task force commissioned to study drainage problems on the west side of the San Joaquin Valley in California identifies water conservation as a major component of its plan to manage the drainage problem.

> The agencies with major responsibility for delivery of water to the study area (U.S. Bureau of Reclamation and California Department of Water Resources) should increase their work with the university extension systems and water districts to demonstrate ways to improve the efficiency of irrigation water application and thereby reduce potential drainage-water volumes.[15]

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10 *Refuge Water Supply Investigation*, Bureau of Reclamation, March 1989, Table S-1.

11 T. Harris, *The Kesterson Syndrome*, The Amicus Journal, Fall 1989, pp. 4-9.

12 T. O. Miller, G.D. Weatherford, & J. E. Thorson, *The Salty Colorado*, 1986, pp. 8, 9.

13 Id. p. 9.

14 K. D. Frederick and J. C. Hanson, *Water for Western Agriculture*, 1982, pp. 188, 189.

15 U.S. Department of the Interior and California Resources Agency, *A management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley*.

In this context, the Bureau's focus should shift from removing more water from streams and wetlands for irrigation to managing existing water supplies to reduce irrigation drainage and increase water flows through rivers and wetlands.

II. WATER CONSERVATION POLICY BEFORE THE RRA

In its own view, the Bureau has been a promoter of water conservation since its founding in 1902. The Bureau's purpose, after all, was to "conserve" water that would otherwise, it was thought, "run to waste" in the sea or some inland sink like the Great Salt Lake. The greater part of the work of conservation was considered to be accomplished by diverting this water to the edge of farmers' fields. Efficiencies of on-farm use were left to the discretion of individual landowners.

Generally, the price the Bureau charges for water is set so low that the cost of water constitutes a small portion of the farmer's costs of production. As a result, overwatering is common. So long as water is cheap and the effects of gross overirrigation, such as waterlogging or salt accumulation, are not obvious, there is little reason to save water. On the contrary, there is a positive reason to use it, since it is by use that the landowner can most plausibly maintain a claim to water. "Use it or lose it" is the rule.[16]

Thus, during much of the Bureau's existence, conservation was a matter of getting water out of streams and onto fields. In more recent years the concept of conservation has undergone a fundamental change of meaning. The phrase "running to waste" has lost its force. Maintaining instream flows, estuaries, wetlands, and terminal lakes have become aims of conservation in the sense in which we use the word today, which can be summarized as beneficial reductions in water use or water losses. In its Second National Water Assessment, the U.S. Water Resources Council stated:

> Irrigation is a prime candidate for water conservation because of the large quantities of water used and its concentration in the relatively water-short Western States. Irrigation accounts

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16 "The incentives under this system are for an individual appropriator to utilize high applications of irrigation water merely to maintain the security of an existing water right. This practice is a significant disincentive to conservation efforts because the individual or organization that bears the costs of improving water efficiency cannot receive the benefits of or compensation for taking such measure." *Water Efficiency: Opportunities for Action*, Report to the Western Governors from the Western Governors' Association Water Efficiency Working Group, 1987, p. 68.

> for 47 percent of total national withdrawals and 81 percent of consumptive use. Recent reports indicate that the potential for saving in irrigation withdrawals is from 20 to 30 percent, or a 30 to 45 bgd [billion gallon per day] savings.[17]

III. THE RECLAMATION REFORM ACT OF 1982

As a result of the prolonged struggle over enforcement of the acreage limit in the 1902 law, culminating in the successful National Land for People suit, Congress passed the Reclamation Reform Act of 1982. The Act raised to 960 acres the limit on the acreage in one ownership that could receive subsidized water, if recipients agreed to amend their water service contracts and agree to pay, at minimum, the annual operation and maintenance costs of water delivery. In the course of the acreage limitation debates central to the RRA, Congress added provisions to the act requiring the Bureau to promote water conservation efforts by water users.

The Law

Section 210 of the Reclamation Reform Act of 1982 reads as follows:

> (a) The Secretary shall, pursuant to his authorities under otherwise existing Federal Reclamation law, encourage the full consideration and incorporation of prudent and responsible water conservation measures in the operations of non-Federal recipients of irrigation water from Federal Reclamation projects, where such measures are shown to be economically feasible for such non-Federal recipients.
>
> (b) Each district that has entered into a repayment contract or water service contract pursuant to Federal Reclamation law or the Water Supply Act of 1958, as amended (43 U.S.C. 390b), shall develop a water conservation plan which shall contain definite goals, appropriate water conservation measures, and a time schedule for meeting the water conservation objectives.
>
> (c) The Secretary is authorized and directed to enter into memorandums of agreement with those Federal agencies having capability to assist in implementing water conservation measures to assure coordination of ongoing programs. Such

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[17] The Nation's Water Resources, 1975-2000, Vol. 1: Summary, December 1978.

memorandums should provide for involvement of non-Federal entities such as States, Indian tribes, and water user organizations to assure full public participation in water conservation efforts.

The Regulations

In 1983 interim rules and regulations for implementation of Section 210 were published. The final version was published in April 1987, with few changes, despite testimony by the National Wildlife Federation and other environmental organizations pointing out the inadequacy of the interim rules. The changes from the interim version to the final version were (1) that districts have not only to develop a plan but must actually submit it to the Bureau, and (2) that conservation efforts must include municipal and industrial uses of water. (Some districts that have contracts with the Bureau provide large amounts of water to municipal and industrial uses.)

The final regulations read as follows, with 1987 additions underlined:

> (a) *In general.* The Secretary shall encourage the full consideration and incorporation of prudent and responsible water conservation measures in all districts and for the operations by non-Federal recipients of irrigation <u>and M & I (municipal and industrial)</u> water from Federal Reclamation projects.
>
> (b) *Development of a plan.* Districts that have entered into repayment contracts or water service contracts according to Federal Reclamation law or the Water Supply Act of 1958, as amended (43 U.S.C. 390b), shall develop <u>and submit to the Bureau of Reclamation</u> a water conservation plan which contains definite objectives which are economically feasible and a time schedule for meeting those objectives. <u>In the event the contractor also has provisions for the supply of M & I water under the authority of the Water Supply Act of 1958 or has invoked a provision of that act, the water conservation plan shall address both the irrigation and M & I water supply activities.</u>
>
> c) *Federal assistance.* The Bureau of Reclamation will cooperate with the district, to the extent possible, in studies to identify opportunities to augment, utilize, or conserve the available water supply.[18]

[18] 43 C.F.R. 426.19 (1987).

The rules and regulations do little to explain the law, and in fact distort it in three ways:

1) The rules confuse the responsibilities of the Secretary and those of the districts. There are two distinct and different parts of Section 210 of the RRA, one directing the Secretary of the Interior to do certain things (subsection (a)) and the other directing irrigation districts in the West to do certain things (subsection (b)). To say, as the rules and regulations do, that the RRA requires districts to file conservation plans where the objectives are economically feasible, is to mix elements, one from section 210(a) and another from section 210(b). The law requires the Secretary to encourage water conservation where such measures are shown to be economically feasible for such non-federal recipients.

This confusion between Subsections (a) and (b) of the law led the rules to ignore the water conservation responsibilities that the Secretary has under all existing laws. Subsection 210(a) of the RRA requires the Secretary to exercise "his authorities under otherwise existing federal Reclamation law to encourage the full consideration and incorporation of prudent and responsible water conservation measures . . ." The preparation of the rules represented a missed opportunity to describe, explain and consolidate existing responsibilities and authorities of the Secretary pertaining to water conservation.

2) The regulations blurred the distinction between "goals" and "measures" in section 210(b) into "definite objectives." The law refers to "where such measures are . . . economically feasible." The rules refer to objectives. This error paved the way for even deeper confusion in the Bureau's *Guidelines* described below.

3) Whereas section 210(c) of the RRA is concerned with the Bureau's cooperation with other agencies, federal and non-federal, on water conservation alone, subsection (c) of the regulations added the words "augment" and "utilize" to "conserve." The RRA directs the Bureau to cooperate with districts in conserving the available water supply, not in augmenting it. Because the Bureau's proclaimed "new mission" is to move away from augmenting the water supply toward conserving the supply that already exists, this is an especially inconsistent distortion of the law.

The National Wildlife Federation called the attention of the Bureau of Reclamation to the inadequacy of its rules and regulations. Representatives of NWF commented on proposed rules and regulations in 1983 and 1987, pointing out both times that these rules and regulations should contain minimum criteria for an acceptable plan, timetables for

plan development and implementation, examples of acceptable conservation actions, sanctions for non-compliance, and provisions for plan enforcement by the Secretary of the Interior or by aggrieved persons and states and agencies. The Bureau ignored these comments.

The Guidelines

In January 1985, the Bureau of Reclamation issued *Guidelines for the Development of Irrigation Water Conservation Plans*, to help the Bureau's regional offices in implementing section 210(b) of the 1982 RRA. A cover letter from Acting Reclamation Commissioner Robert A. Olson reminded regional directors that former Commissioner R. Keith Higginson, on July 17, 1979, had advised them that all future repayment and water service contracts would include conservation provisions. Standard language for these contracts included the following:

> [The] water conservation program shall contain definite goals, appropriate water conservation measures, and time schedules for meeting their water conservation objectives.

This language is almost identical with that in section 210(b) of the 1982 law, quoted above. Commissioner Olson's cover letter went on to say that water conservation plans were to be reviewed by the Contracting Officer at five-year intervals after execution of the contract, and added,

> Given the similarity in requirements between our 1979 policy and the Reclamation Reform Act, each region should have already reviewed and approved district/contractor water conservation plans developed pursuant to provisions of contracts signed since 1979. Some regions may already have completed the 5-year review required. In effect, our current policy and procedures should meet requirements of the Reclamation Reform Act.[19]

It appears, then, that the Bureau interpreted the water conservation provisions of the 1982 Act to be a mandate to continue what it was already

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19 Letter from Acting Reclamation Commissioner Robert A. Olson to Regional Directors, July 17, 1979, p. 3.

doing. This interpretation can be seen also in a later statement by former Interior Secretary Donald Hodel, as follows:

> . . . All new and amended contracts contain a standard water conservation article that reflects Reclamation policy in effect since 1978. That article requires development of a water conservation plan consistent with the requirements of section 210 of the Reclamation Reform Act of 1982, which requires the development of water conservation plans where such measures are shown to be economically feasible.[20]

In addition, Secretary Hodel's statement perpetuated the misrepresentation in the rules and regulations implying that conservation plans are to contain only economically feasible measures.

We have seen that the rules and regulations contained less reliable guidance for irrigation districts than the law itself. This means that the 1985 *Guidelines* were the major source of advice to districts in preparing conservation plans. It is therefore worthwhile to look at some of the provisions of this document.

> A good introduction must include a general description of the district. This would include a map of the service area with all facilities, a discussion of its history; a description of the water supply sources; and a listing of the crops, soils, acres, and climate factors.
> After the introduction, the order of the chapters could be system inventory, problem areas, conservation goals, selection of corrective actions, implementation arrangements and time schedules, technical assistance, and evaluation procedures to determine if goals have been achieved. Additional chapters can be added as needed, and appendixes are probably necessary. The appendixes could contain delivery efficiencies of individual canals, calculations of costs and benefits, references to other reports, district rules and regulations, and definitions of terms used in the chapters.[21]

The *Guidelines* recommended that the plan include an evaluation of benefits and costs, bearing in mind that these do not always accrue to the same parties.

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[20] Letter from Secretary Hodel to Rep. George Miller, Chairman, Committee on Interior and Insular Affairs, U.S. House of Representatives, May 16, 1988.
[21] *Guidelines*, page 9.

> Benefits include savings of water, energy, fertilizer and labor as well as improved water quality, reduced drainage costs, and improved crop production. Costs include the labor, construction and management costs on nonstructural changes.[22]

It can be seen that the writers of the *Guidelines* expected a conservation plan to be a rather substantial document. Very few conservation plans examined for this report come anywhere near the level of comprehensiveness suggested by these *Guidelines*.

Even following the *Guidelines* would not necessarily have led to the development of sound conservation plans. Indeed, a fundamental flaw of the Bureau's conservation program seems to originate in the *Guidelines'* discussion of goals and measures to meet goals. Examples of goals are given as follows:

> . . . installing measuring devices at all farm turnouts, converting open ditches to buried pipe, computerizing some district operations, conducting educational programs for water users, improving district-wide irrigation efficiencies to a certain level, or reducing energy consumption by a certain percentage.

After goals have been established, districts are to select appropriate corrective actions.

> Some examples of corrective actions may be the purchase and use of a computer to improve record management during the first year, replacing 5 miles of ditch laterals with buried pipe each year, changing to an increasing block rate pricing system after installing all water meters, setting appropriate water allocations each year, installing 25 water measurement devices each year, concrete lining 3 miles of a canal each year, or retaining a private consultant to further study a problem in a future year.[23]

These lists of "goals" and "actions" occur within a few lines of each other in the *Guidelines*. The reader is challenged to divine the logic that governed the placement of an item in one list rather than the other! There is a fundamental confusion here between means and ends, or "measures" and "goals," to use the Bureau's usual language. This confusion pervades

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22 *Guidelines*, p. 4.

23 *Guidelines*, pp. 5, 6.

Bureau efforts in conservation, and has enfeebled most district conservation plans submitted to the Bureau.

A goal is the end of an undertaking, the destination to which efforts are to lead. Measures are the various ways in which that destination may be reached. In the case of water conservation plans, the goal must be to conserve water and to achieve benefits related to water conservation. A goal can be expressed quite briefly, as a certain quantity of water to be conserved. The measures may take more room to set forth, since there are many possible measures that may be more or less appropriate to a local situation. The Bureau's blurring of the distinction between goals and measures allows the districts to take the easy way out in developing weak plans. If any progress is to be made in water conservation, the two terms must be clearly defined. The Bureau has continued to confuse them in its own *Guidelines* for districts.

Evaluation and monitoring criteria

A 1989 Bureau policy memorandum provided additional guidance for the Bureau's Regional Directors to evaluate the water conservation plans, but continued most of the errors of the *Guidelines*.[24] It required water conservation plans to contain "more than one definite goal or objective," but again confused measures with goals, listing "increased accuracy in recordkeeping" and "increase cooperation with other local districts and state entities" as acceptable water conservation goals. Furthermore, the limited requirements of the policy that the plans contain time schedules for implementation and that acceptable plans be submitted before contracts can be renewed are meaningless if these requirements are not enforced by the Bureau. As discussed in Section V. below, NWF's review revealed that the Bureau has not enforced even the minimal standards it has set for acceptable conservation plans. And the Bureau has never set a standard requiring actual implementation of the plans.

The Bureau's interpretation of the scope of section 210(b)

Under the Bureau's interpretation of 210(b) there are some categories of districts that do not have to develop water conservation plans.

1) According to a memorandum to the Regional Director in the Mid-Pacific Region from Acting Commissioner Clifford I. Barrett,[25] "practicality and common sense dictate that in certain situations elaborate water

[24]Memorandum from Acting Commissioner to Regional Directors, Oct. 31, 1989.
[25] Interior Dept. reference number 426.19-0003, Dec. 11, 1985.

conservation plans are simply inappropriate." The memo goes on to specify two types of such situations: (1) temporary contracts of one year or less, and (2) contracts with individuals and small entities, where small is defined as 2000 acres or less served with Bureau water. This definition ignores the potential for leveraging the total water use of these districts with Bureau water conservation. The memorandum also exempts cases involving a number of small contracts even if the total acreage served by the distribution system exceeds 2,000 acres.

In the Pacific Northwest Region, 24 districts of fewer than 2000 acres each, totalling 25,000 acres, are exempt under this provision. An additional ten districts between 2000 and 3000 acres each have been exempted at the regional director's discretion. Thus it would seem that something on the order of 50,000 acres in the Pacific Northwest region alone were not required to file conservation plans under the small district exemption.

2) A memorandum dated October 31, 1986, from Reclamation Commissioner Dale Duvall exempted from the water conservation requirements of section 210(b) those districts that are subject only to contracts with the Small Reclamation Projects Act (SRPA) and the Water Conservation and Utilization Act (WCUA).[26] This resulted from a decision by the Department of the Interior Solicitor that both the SRPA and WCUA are separate and distinct from the general core of federal Reclamation law. SRPA authorizes subsidized loans to certain irrigation districts, which do not receive water from the Bureau. WCUA provides for the construction of small irrigation projects, subject to separate repayment provisions. The memorandum also exempted some Bureau customers who are covered by water service or repayment contracts and are receiving water under the Warren Act, which provides for the sale of excess water available from Bureau projects.[27]

3) The Bureau exempts some districts from the conservation requirements because of pre-existing water rights. For example, the Central California Irrigation District is deemed exempt because the water conveyed to it via the Delta-Mendota Canal fulfills the district's pre-existing San Joaquin River water rights, acquired in the 1870's. When the Central Valley Project diverted the river upstream at the Friant Dam, it was legally obliged to replace the water. It did this by conveying water via the Delta-Mendota Canal to a point on the San Joaquin above the headworks of the

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26 Letter from William C. Klostermeyer, Assistant Commissioner of Reclamation, to Edward R. Osann, April 22, 1988.

27 Memorandum from Associate Solicitor Keith Eastin to the Commissioner of Reclamation, August 28, 1985.

Central California and other irrigation districts. This water is thus construed not as a CVP delivery but as a replacement for water diverted upstream.

4) The Bureau and the U. S. Army Corps of Engineers have competed for projects in some parts of the West, and the resulting arrangements are sometimes rather complex. Corps projects are exempted from the Reclamation Reform Act under section 212(a). The exemption does not, however, include projects that are made a part of, or integrated with, a Bureau project.[28] For example, Fresno Irrigation District, with 162,202 irrigated acres, which receives most of its water through Corps projects on the Kings River, also takes some Bureau water (29,051 acre-feet in 1986) and therefore filed a conservation plan. In addition, the Bureau administers water service contracts for Corps projects, for example, the Kings River and Kern River Projects in California. The Bureau apparently considers such projects to be exempt under section 212(a).

5) In one important regard, the Bureau has reversed itself on the question of which districts are required to file conservation plans. Some districts, called paid-out districts, have repaid, usually over a period of many decades, the construction costs of the projects the Bureau built for them. The Bureau initially decided that paid-out districts were exempt from 210(b), on the grounds that, having fulfilled their obligations to the federal government, they were not subject to laws enacted later.

On October 31, 1986, however, Commissioner C. Dale Duvall notified regional directors that paid-out districts were not after all exempt from conservation plans.[29] This is noteworthy, because districts that have been in existence long enough to have completed a pay-back period are found in older Bureau project areas. They are thus more likely to have obsolete facilities, and, as a group, could probably benefit more from conservation measures than other districts. Paid-out districts in our sample of 43 include Lower Yellowstone, Pathfinder, and Truckee-Carson.

We find it hard to form an accurate estimate of the total amounts of land and irrigation water that are exempted from conservation reporting through the provisions discussed above, but we believe they comprise between 10% and 20% of the total land served and water delivered by the Bureau. There are some 3,000 entities contracting for water from the Bureau, but only 884 were required to submit conservation plans. Many

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28 Reclamation Reform Act § 212 (a)(1), 43 U.S.C. § 390*l* l(a)(1).

29 Memorandum from C. Dale Duvall to Bureau of Reclamation Regional Directors (October 31, 1986).

of the remaining 2,100 are quite small, less than 100 acres in some cases. The National Wildlife Federation sample of only 5% of districts required to report accounts for 36% of the Bureau's service area. Our assumption is that most of the Bureau's total service area is subject to the conservation reporting requirements of section 210(b). In some areas, however, large amounts of irrigated land may have been exempted.

Response of the districts

When the Bureau sent the *Guidelines* out to the regional offices in January 1985, it set July 1, 1987, nearly five years after the enactment of the RRA, as the deadline for districts to submit conservation plans. The degree of compliance by districts seems to have satisfied the Bureau. In response to questions from the House Appropriations Committee at a hearing on February 22, 1989, Commissioner Duvall presented the following summary statistics.[30]

STATUS OF WATER CONSERVATION PLANS

Region	Plans Expected	Plans Submitted	Plans Accepted
Pacific Northwest	135	100	99
Mid-Pacific	319	280	275
Lower Colorado	75	75	68
Upper Colorado	47	46	39
Missouri Basin	308	308	308
TOTAL	884	809	789
Percentage of total	100	91	89

30 *Energy and Water Development Appropriations for FY 1990: Hearings before the Subcommittee on Energy and Water Development of the House of Representatives Committee on Appropriations*, 101st Cong., 1st Sess., p. 705 (1989) (Commissioner Duvall's response to questions submitted by the Hon. Silvio O. Conte).

The table's conclusions provide an interesting background to our own findings. The Bureau received conservation plans from 92% of the districts that were required to file them, and accepted 98% of these. It seems fair to say, judging from these figures, that the Bureau was satisfied with the way contracting districts complied with the water conservation plan requirements of the RRA. In contrast, NWF sees little evidence for complacency in the Bureau's slow pace in developing regulation to implement the RRA water conservation provisions, and in the large number of exemptions that the Bureau has carved out administratively.

The low priority assigned to implementation of section 210 of the RRA by the Bureau is doubly disappointing because in 1987 the agency issued a new mission statement. *Assessment '87* found that the Bureau must change its primary orientation from one based on federally supported construction to one based on effective and environmentally sensitive resource management. "More attention is being given to alternative means of supplying water through improved system management, joint use of surface and groundwater supplies and reevaluating priority of use. Conservation of water and protection of the environment are major public concerns."[31] However, the Bureau's actions do not support the conclusion that the Bureau shares the public's concern and urgency that water conservation is and should be a high priority.

IV. NWF'S REVIEW OF SELECTED WATER CONSERVATION PLANS

As we have just seen, the Bureau of Reclamation has determined that 884 districts must submit water conservation plans. Our present report is based on a review of 43 plans, summarized in Table I. We selected these districts with a view to representing a wide range of district size and a broad geographic coverage of the 17 states served by the Bureau of Reclamation. Our sample contains only 5% of the plans but covers 36% of the land served by the Bureau and 37% of water delivered to farmers.

These plans vary enormously in quantity and quality. A few districts took the conservation plan requirement seriously, while most districts evidently regarded it as a mere formality. A rough indication of this variation is given by the number of pages in each plan, as shown in Table I. The number of pages in a report is not necessarily an indication of its value, but the references to "chapters" and "appendices" in the *Guidelines* make it clear that a substantial document was envisioned. It is hard to see how a district could produce a serious plan in fewer than ten pages. But if our

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31 *Assessment '87 ... A New Direction for the Bureau*, Bureau of Reclamation, Washington, DC, 1987, p. i.

sample is representative, it looks as though a large number of districts have submitted documents even slighter than this. A number of plans consist of nothing more than a few typed pages. For example, the reports from the Uncompahgre Water Users' Association (Colorado) and Pathfinder Irrigation District (Nebraska), using 278,000 acre-feet and 191,000 acre-feet of water respectively, consist of three pages each. Minidoka Irrigation District (Idaho), which uses 455,000 acre-feet, weighed in with one-and-a-half pages.

At the opposite extreme is Imperial Irrigation District's massive report, which is one of the few that appears to meet the requirements of the law. The completeness of Imperial's report, however, was stimulated not by Bureau enforcement of section 210(b) but by the California Department of Water Resources' 1981 finding that water was being wasted in the Imperial Valley. Hearings by the California Water Resources Control Board in 1983 led that body to issue an order for the Imperial Irrigation District to develop a water conservation plan. This episode illustrates both that it is possible for an irrigation district to produce a good conservation plan, and that it may require vigilance and vigor by regulatory bodies to make sure the job is actually done.

The Bureau's indulgence, on the other hand, tempts districts to do as little as possible. Solano Irrigation District submitted a minimal plan in 1985. Five years later, however, Solano's updated plan, the only one in our selection updated to date, was nearly identical to the 1985 plan. The majority of the text had been repeated verbatim from the 1985 plan, including time frames and work accomplished. Thus, conservation measures that were to be implemented within 10 years of 1985 are now planned to be implemented within 10 years of 1990. The district managers had apparently gotten the message that the plans were nothing more than a formality. The Mid Pacific Region of the Bureau agreed; they approved the 1990 plan.

It is not necessary to produce a book-size volume to comply with the RRA, however. The Roza Irrigation District (Washington) did a creditable job in 75 pages, although part of this district's plan was actually prepared by the Northwest Region of the Bureau. The El Dorado Irrigation District (California) presented a good plan in 34 pages--at least partly, it would appear, because of ten years of cooperation in water conservation activities with state and federal agencies.

NWF's analysis is summarized in Table I. The four columns labelled quantitative goals, specific measures, timetable, and budget, highlight the

key features of these plans and their degree of compliance with the conservation requirements of section 210(b). The results are as follows:

Goals. Some estimate of actual amounts of water to be saved is essential to any serious water conservation plan. And by this criterion the plans are, as a group, unimpressive. We put a "yes" in this column if the plan contained *any* reference to amounts of water that might be saved. For example, the Coachella Valley Water District plan notes in passing that the district loses 30,000 acre-feet annually and proposes to reduce the loss by canal lining. It gets a "yes" in the quantified goals column. Even by this liberal interpretation of quantification, only 11 out of the 43 plans in our sample say anything about the amounts of water that might be saved.

Measures. All but five of the plans in the sample did cite specific measures for conservation. To get a yes in this column a district had only to propose *some* specific measure that might have something to do with saving water. Even a routine reference to canal lining would do. Still, five districts got a "no."[32]

Timetables. Any statement about a particular date for the completion of proposed measures was enough to get a yes in this column. Still, only 22 of the 43 plans contained even this.

Budgets. The budget column does not relate to an explicit provision of section 210(b). We believe, however, that any serious conservation plan would require some discussion of how proposed conservation measures would be financed. Only 16 districts in the sample met this criterion.

Final Grade. Even with our very lenient criteria, we could have approved (i.e. given four "yes's" to) only nine out of the 43 in our sample, a pass rate of 21%. It should be emphasized that we were quite generous in reviewing these plans. If we could find anything to justify a "yes" in one of these four columns, even if it was no more than an isolated phrase or sentence, we entered a "yes." Thus a plan that got four "yes's" is not necessarily a good plan; it is simply better than most that were submitted. It is not plausible that the Bureau reviewed these plans carefully, or it would never have passed 98% of them.

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32 The districts expressed good intentions to save water, but one (Pine River Irrigation District in Colorado) claimed that it lacks the authority to enforce any conservation measures at all.

V. FINDINGS OF THIS REPORT

Absence of quantified goals

The *Guidelines* define water conservation as "the beneficial reduction in water use or water losses." Beneficial reduction is directly related to irrigation efficiency, which is defined by the *Guidelines* as "the ratio of the quantity of applied water used in crop evapotranspiration and the leaching requirement to the total quantity of diverted water." Irrigation efficiency can be measured at a variety of scales, but for the Bureau's purposes, "the season-long, district-wide irrigation efficiency is the most important measurement of how the district manages its water."[33]

Since the goal of conservation plans is to achieve such a beneficial reduction in water use or losses, the way to evaluate a plan is to ask how much water it proposes to save, and how realistic the proposed measures are likely to be in achieving that goal. In our view, *the fundamental flaw of these conservation plans is that they do not formulate goals in terms of actual amounts of water to be saved, either in acre-feet or as a percentage of current use.* Unless a district commits itself to some specified measurable performance goal, its conservation plan is not likely to be worth much.

Confusion between goals and measures

Instead of proposing quantified goals, most plans in the sample propose what are actually measures, and then call them goals. Metering turnouts, lining canals, installing pipe, holding seminars and workshops for ditch riders and landowners, etc. are given again and again in these plans as conservation goals, but in fact *these are measures that can be taken to achieve goals, not goals in themselves.*

Meters can be installed, but with the subsidized price of water as low as it is in some districts, meters may have little effect on the amount of water used. A concrete-lined canal will lose less water to seepage than an unlined canal in the same place, but that amount will vary widely according to climate and soil type, and may not contribute significant net savings if there is groundwater pumping in the district. Ditch riders may sharpen useful skills and pick up much valuable information at workshops, but this does not necessarily mean that their districts will conserve more water.

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[33] All quotes in this paragraph are from page 3 of the *Guidelines*.

The basic problem with measures masquerading as goals is that they can't lose. If a district proposes metering a certain number of turnouts every year as its conservation goal, and then meters that number of turnouts, it will have met its conservation goal, whether or not there was any significant beneficial reduction in water use or water losses, and despite the possibility that some other measure might have been much more effective.

In our opinion, the failure of district plans to make a clear distinction between means and ends can be laid at the feet of the Bureau of Reclamation. As we noted in discussing the instructions that the Bureau sent out to districts (section III above), the Bureau's *Guidelines* define goals in a way that defeats clear thinking on conservation right from the beginning.

Routine maintenance presented as conservation

Many districts compound this confusion by proposing as conservation goals those actions that are are basically routine maintenance chores. Clearing weeds from canals, removing sediment, and replacing worn headgates fall into this category. It is true that some such measures are likely to save water, but if they are measures that any well-run district should take anyway, they should not be credited as a step towards permanent beneficial reduction.

Absence of time schedules

The failure to provide time schedules is probably related to the failure to commit to serious goals. It appears that the many districts, taking their cue from the Bureau's guidelines and producing a list of measures in lieu of goals, simply developed a wish list of good ideas that might be implemented someday if finances permit. Of course a time schedule is not to be expected in such cases.

Conjunctive planning of surface and groundwater ignored

Proposals for district-level conservation tend to emphasize canal-lining, leak detection, and other physical means of reducing conveyance losses of surface water. These have an understandable appeal as visible, fundable activities, but if most of this water is being recovered later by groundwater pumping, the net saving on a district-wide basis may be small. This is all the more true where districts are promoting groundwater recharge, in which case canal leakage may be part of a district's water management plan.

Failure to take conservation seriously

It is clear that the Bureau has not been very demanding in getting contracting districts to write conservation plans. The Bureau took an unnecessarily long time to promulgate the regulations, and then interpreted the law to allow districts to go on doing what they were already doing. It set a deadline for compliance five years after passage of the law, and then proved willing to extend it by two more years in order to give districts extra time.[34]

The go-it-alone attitude of the Bureau reflects another gap in its water conservation program. With the drought in the West now in its fifth year, one would have expected a crash effort to develop and implement strong cooperative conservation activities with other agencies. Instead, the Bureau has discussed the problem with other federal and non-federal entities, but not involved even one of them as explicitly required by section 210(c).

The reasons for the Bureau's reluctance to enforce the law are no great mystery. Some Bureau employees have expressed sympathy for districts because the "use it or lose it" tradition of the West really gives districts little incentive to practice conservation.[35] What's more, most state water rights are premised upon the grantee making "beneficial use" of water, leaving some districts reluctant to own up to any significant wastage in their operation. And employees of the Bureau have for 85 years advanced their careers by providing more water to districts, not by getting them to make do with less.

In sum, the occupational subculture of irrigation management does not encourage rigorous enforcement of any measure that, like the conservation plan requirement, tends to put the Bureau and the districts into an adversarial relationship. It should not be surprising that districts tend to drag their feet on water conservation and get away with it. This

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[34] Although the Bureau's deadline for receipt of plans was July 1, 1987, the Upper Colorado Region sought and got permission from the Bureau to accept preliminary statements (so-called "stage one plans") on that date and extend the deadline for fully developed plans to July 1, 1989.

[35] It is interesting to note in this regard that a Bureau study on water conservation made these observations as far back as 1978: "Two of the major factors which inhibit implementation of water conservation measures are: (1) the probable reluctance by water users within the irrigation services area to relinquish any rights of water, and (2) the lack of procedures whereby beneficiaries outside the irrigation service area share in the reimbursable costs of the conservation measures." *Report on the Conservation Alternatives Study*, Bureau of Reclamation, September 1978.

does not excuse non-enforcement of the law, but it is something that must be taken into account in fashioning new remedies.

VI. NWF RECOMMENDATIONS

Water conservation practices are now gaining acceptance and achieving results for urban water systems from Boston to San Diego. The Bureau of Reclamation will have to play catch-up ball to get abreast of state, local, and private sector initiatives in this field, and lead its largely agricultural constituency to share in the benefits of efficiency improvements. Conservation is not castor oil, but if federal water managers feel that it is, then their irrigation customers are not likely to feel much different.

We recommend a complementary set of carrots and sticks that will hasten the application and effectiveness of water conservation measures. Efficient use of water is required to halt the spiraling decline of fish and wildlife populations, maintain agricultural capacity, and sustain urban economies.

1. The Commissioner of Reclamation should rewrite and strengthen the requirements for water conservation by the Bureau's customers, pursuant to section 210 of the Reclamation Reform Act. *Using existing authority to the fullest extent, the Bureau's water conservation program should include:*

- The prompt implementation by all districts of widely recognized management practices for conserving water, including metering of all users, billing based upon metered use, and the elimination of promotional water rate structures and contracting practices;

- The establishment by all districts of a continuous program for making cost-effective investments in water conservation, based upon new plans to be submitted within 30 months;

- The identification of a quantitative goal and realistic timetable for water saving improvements by each district. Conservation measures yielding 10% savings in average water use should be achieved within 10 years, unless a customer can show that such savings cannot be achieved in a cost-effective way;

- Expanded technical assistance to districts for the identification, evaluation, and implementation of water saving measures, and encouragement to districts to collaborate on conservation programs;

- Application of water conservation requirements to the several categories of water users currently excused from compliance by the Bureau, including Small Reclamation Project loan recipients and irrigation districts served by reservoirs constructed by the Corps of Engineers; and

- Meaningful sanctions for non-compliance, including penalties in dollars or water or both.

II. The Bureau of Reclamation should actively promote markets for water that enable irrigators to profit from conservation. *There is no better incentive than profit. As the major operator of water storage and conveyance facilities in the West, the Bureau has the ability to promote and facilitate water markets and other innovative proposals that allow irrigators to profit from conservation.*

The Bureau's 1988 policy statement on water marketing said the agency would not stand in the way of beneficial transfers of Reclamation water. The Bureau must go further. Without the Bureau's active cooperation and participation, the potential benefits of transfers and markets can not be fully realized. The Bureau should encourage states and private brokers to engage in water transfers and develop innovative quasi-markets that benefit both buyers and sellers. Selling, renting, optioning, or leasing their allocations of Reclamation water would allow water users to capture the wealth implicit in their historical allotments, while letting conserved water be used by others. The Bureau should make its storage and conveyance facilities available for transfers of both Bureau and non-Bureau water. Congress should determine what share, if any, of new conservation profits should be recaptured for project repayment or other public purposes.

III. The Bureau of Reclamation should modify its pricing policies, and Congress should revise laws that underprice water and undercut conservation incentives. *Underpriced federal water impedes voluntary and regulatory efforts to conserve water. The large subsidies in the price of Reclamation water and electric power used for pumping water are responsible for most of the misallocation of water to marginal uses.*

Within the context of existing laws, the Bureau should rewrite the RRA regulations to recover capital costs as well as operations and maintenance costs on amended and renewed water service contracts, and ensure that "full cost" is charged for water delivered to acreage in excess of 960 acres. The Bureau has interpreted federal laws and regulations to minimize and stretch out repayment requirements for the costs of the projects so that irrigation water prices can be kept low. For example, not one dollar of the

one billion dollars of capital costs assigned to irrigation for the Central Valley Project in California has been repaid--more than 40 years after water deliveries began. The Bureau must strengthen the 1988 CVP Irrigation Pricing Policy formulated in response to an Inspector-General's audit. The policy does little to raise prices and lower demand.

IV. The Bureau's water conservation programs should be integrated with federal, state, and local efforts to enhance and restore fish and wildlife habitat. *Wetland and riverine habitats require more water to sustain fish and wildlife populations.*

In conjunction with federal, state, and local agencies, the Bureau and irrigation districts should identify beneficial uses for conserved water that include instream flows and habitat restoration. A substantial percentage of any water conserved or proposed for transfer should be dedicated to fulfilling the United States obligations and objectives under the North American Waterfowl Management Plan, the Endangered Species Act, and similar federal environmental commitments.

V. The Bureau should identify reclamation-served lands with acute drainage problems and establish innovative water conservation programs to mitigate those problems. *Water conservation minimizes the leaching of naturally occurring toxins, reduces the volume of polluted drainage water, and lowers high water table that can result in salinization.*

The Bureau should require that water conversation plans submitted by districts in regions with acute drainage problems include plans to reduce drainage through increased irrigation efficiencies. These plans should emphasize input-conserving technologies, cultural practices, and crop substitution proposals that reduce irrigation water application. Lands with the highest concentration of potentially dangerous minerals or chemicals should be taken out of production, and water used to irrigate those lands should be redirected toward fish and wildlife needs.

TABLE I COMPLIANCE WITH RRA

CONTRACTING AGENCY	date of plan	pages	quantified goals?	specific measures?	timetable?	budget?
City of Lindsay	Mar-86	21	no	yes	no	no
Carpinteria County W. D.	Mar-87	17	no	yes	yes	yes
Centinella W. D.	May-87	11	no	yes	no	no
Clear Creek Community Services Dt.	Nov-85	7	no	yes	yes	no
El Dorado I.D.	Dec-85	34	yes	yes	yes	yes
Exeter I.D.	Jun-86	8	no	yes	no	no
Fresno I.D.	Jul-86	10	no	yes	yes	no
Glenn-Colusa I.D.	Oct-86	14	yes	yes	yes	no
Truckee-Carson I.D.	n.g.	6	no	yes	no	no
Westlands W. D.	Jun-86	21	yes	yes	yes	yes
Solano I.D.	Jun-85	8	yes	yes	yes	yes
Maine Prairie W. D.	Jun-86	3	no	no	no	no
Orchard Mesa I.D.	Apr-87	4	no	yes	no	no
Grand Valley Water Users' Assn	May-87	20	no	yes	yes	no
Ogden River Water Users' Assn	Apr-87	18	no	yes	no	no
Ephraim Irrigation Co.	Jul-87	3	no	yes	no	no
Horseshoe Irrigation Co.	Jul-87	4	no	no	no	yes
Weber Basin Water Conservancy Dt.	Dec-86	5	no	no	no	no
Uintah Water Conservancy Dt.	Jul-87	3	no	no	no	no
Pine River I.D.	Jun-87	3	no	no	no	no
Uncompahgre Water Users' Assn	Apr-87	3	no	yes	no	yes
Strawberry Water Users' Assn	May-87	70	in prep	yes	yes	yes
Shoshone/Heart Mtn I.D.s	Aug-86	10	no	yes	no	no
N. Colorado Conservancy D.	Jun-86	14	no	yes	yes	yes
Pathfinder I.D.	Apr-87	3	yes	yes	yes	no
Midvale I.D.	May-86	10	no	yes	no	no
Lower Yellowstone I.D.'s 1 & 2	Jun-86	3	no	yes	no	no
Belle Fourche I.D.	Sep-86	9	no	yes	yes	no
Imperial I.D.	Aug-85	200	yes	yes	yes	yes
Coachella Valley W. D.	Apr-87	6	yes	yes	yes	no

TABLE I COMPLIANCE WITH RRA

CONTRACTING AGENCY	date of plan	pages	quantified goals?	specific measures?	timetable?	budget?
Salt River Valley Water Users' Assn	Dec-85	42	no	yes	no	no
Welton-Mohawk I. & D. Dt.	Oct-86	12	yes	yes	no	no
Yuma County W. U. A.	Oct-86	18	yes	yes	yes	no
Elephant Butte I. D.	Jun-87	17	yes	yes	yes	yes
Arch Hurley Conservancy Dt.	Oct-86	5	no	yes	no	no
Hidalgo & Cameron Co. I.D. #9	Aug-86	6	yes	yes	yes	yes
A & B I. D.	Nov-86	16	no	yes	no	no
American Falls Reservoir Dt. #2	Nov-86	6	no	yes	yes	yes
Black Canyon I. D.	Jun-86	6	no	yes	yes	yes
East Columbia I.D.	Mar-87	15	yes	yes	yes	yes
Minidoka I.D.	Oct-86	2	no	yes	yes	no
Quincy-Columbia I.D.	Sep-86	3	yes	yes	yes	yes
Roza I. D.	Jul-87	90	yes	yes	yes	yes

Senator BRADLEY. Thank you very much, Mr. Conrad.

I see the distinguished ranking Member of the subcommittee is here, now. If he would like to ask any questions or make any comments, he may do so. If he would prefer not, I simply want to afford him the opportunity to do so.

Senator BURNS. Thank you, Mr. Chairman. Maybe just a couple of questions.

You know, if it ain't one thing it is another. I do not think there is anybody home in Montana. They are all in town, and half the Crow tribe is out there. And I wish I had gotten in a little more on the statements, but I have to apologize to you that I am going to have to go over your statements tonight to fully understand what you are trying to say, and the ramifications and the conditions under which you make those statements.

So Mr. Chairman, I appreciate that, and I just do not think I could add anything to the questioning here that would be of any great construction to solve some problems. I appreciate that, and thank you.

Senator Bradley. Thank you very much, Senator Burns. In that case, let me ask a few questions.

The proposition that the hydro portions of this bill will produce essentially 16,000 megawatts of energy. Do you believe that to be the case? Ms. Greely.

Ms. GREELY. Yes.

Senator BRADLEY. Mr. Hunt?

Mr. HUNT. Probably not quite that much, because there are some other things in the process that keep it going, that will inhibit some of that.

Senator BRADLEY. Mr. Silkman?

Mr. SILKMAN. It is difficult to speak for the entire country, Senator. It would have very little effect in Maine. Most of our sites are already currently fully developed.

Senator BRADLEY. Mr. Echeverria?

Mr. ECHEVERRIA. No, and I would be happy to amplify.

Senator BRADLEY. Yes?

Mr. ECHEVERRIA. Just to cite two figures, I think it is very significant. The State of Maine, which has significant undeveloped hydropower potential in the sense that it has been batted around here, identifies 28 megawatts as being currently viable and achievable.

Another interesting figure, I think, comes from the Pacific Northwest, where the Northwest Power Planning Council recently did a survey of the achievable hydropower capacity in that part of the country, and came up with a figure of somewhat more than 1,000 megawatts of hydropower capacity, which they thought could be achieved in the next decade. That represents about one-twentieth of the hydropower potential identified by FERC as being out there and capable of being developed.

Senator BRADLEY. That represents one-twentieth, so that is evidence that it will not be 16,000?

Mr. ECHEVERRIA. FERC says there is 23,000—approximately 23,000 megawatts of capacity in the Pacific Northwest. The North Power Planning Council—the interstate, federally chartered agency responsible for managing and planning for energy develop-

ment in the Pacific Northwest—says, well really there is only 1,000.

Senator BRADLEY. 1,000 instead of 23,000?

Mr. ECHEVERRIA. Right.

Senator BRADLEY. Mr. Conrad?

Mr. CONRAD. Mr. Chairman, I think just looking at the demand or the supply curves that the FERC has developed themselves—and I am not vouching for the environmental sensitivities that have been built into those curves—I do not see that you are going to see that kind of hydropower development, unless the price of energy rises dramatically. And that will make the difference. It is not going to be the fishway prescriptions of the National Marine Fisheries Service that is going to make the difference.

Senator BRADLEY. Ms. Greely, would you want to respond, since you were the first to answer the question, and answered in the only straight affirmative.

Ms. GREELY. I answered a straight affirmative for a reason that developed as it went down. Price is clearly a factor. I base my answer, yes, on that fact that I firmly believe that over the next 10 to 20 years the price of energy will rise dramatically, because we are not building new capacity of any type, and we will need that capacity. Restrictions on—there are continuing restrictions on other forms of energy development.

A second reason is I look at energy—at hydropower energy—as not being just the private sector or the public sector, but all of it. I think the net result of this bill will be two things: (1) it will identify and as a result of that identification open up for private development from market sources, hydropower capacity at existing Federal facilities, and (2) it will eliminate some of the uncertainties and restrictions that keep current and non-Federal developers from going forward. Between all of those factors, I think we can get 16,000 megawatts over the couple of decades.

One other comment—excuse me—that I think it is important to note. The projects that are being proposed today, are not funded based upon today's energy prices, and to have a system that says, well, we cannot develop any more hydro today, so let us not improve the regulatory structure is crazy. The projects being developed today will be based upon energy prices 10 years from now, when those projects go on line. If Mr. Conrad can predict what energy prices will be in 10 years, I would like him to get together with the DOE and evaluate the feasibility of those projects.

Senator BRADLEY. Well, let us have a real-life test right here. The State of Maine has predicted that they have 28 megawatts. What price do you assume?

Mr. SILKMAN. We actually have, Senator, a 30-year price available to us. We price our——

Senator BRADLEY. What is that? I am curious.

Mr. SILKMAN. It is levelized; it is a little less than 9 cents a kilowatt hour, and it is based upon Hydro Quebec. We have a contract available from Hydro Quebec, which would provide us 1,000 megawatts of power at a 30-year levelized rate, beginning in 1996, of—actually it is about 9 cents a kilowatt hour, and that is the rate at which we are currently purchasing power from alternative sup-

pliers, whether they be hydropower suppliers, or gas-fired cogeneration facilities, or at our paper mills.

Senator BRADLEY. And that is the price at which you have assumed you were able to get 28 megawatts in Maine?

Mr. SILKMAN. Yes.

Senator BRADLEY. Any comments on that price, one way or the other? Observations?

Mr. CONRAD. I would——

Senator BRADLEY. Otherwise that is the price.

[Laughter.]

Mr. CONRAD. The current licensing process at the Federal Energy Regulatory Commission is in most practical senses ignoring price. They are just going ahead and licensing projects. That is why a lot of the projects that get licensed do not get built. That is built in. There is a——

Senator BRADLEY. Try to focus on whether—you made the point, Mr. Conrad, that these regulatory fixes are not as important as price, and that price is important. So now we are focusing on well, what price are we talking about, if price is important. We have Maine telling us very directly they think they can get 20 megawatts from hydropower if the price is 9 cents.

Now, do you have any thought on price, more or less?

Mr. CONRAD. I think for Maine's situation that is probably a pretty good guess as to what the price is likely to be.

Senator BRADLEY. Mr. Hunt?

Mr. HUNT. The price is the purchase price for power in, for example, New Hampshire in the early 1980's was around 10 cents, 9 cents. Now it is about 4.5 cents, and so there has been a dramatic drop in New Hampshire right next door. And projects that were developed at 9 cents in the early 1980's are no longer feasible.

Senator BRADLEY. But we are looking at price 10 years from now, as Ms. Greely said—the assumption of price 10 years from now on which you are willing to make your projections.

Ms. GREELY. I think it would be fair to say that if you could give a hydropower developer a contract for a 9-cent price for a 10-year period starting 10 years from now, that you could build more than 28 megawatts of power. But perhaps the best way to see the issue of regulatory matters and pricing is in the State of Maine itself, where you have got a project that is being proposed, the Milford Dam project, that is considered to be by the developer economic at this time that has just been denied 401 water quality certification by the State of Maine for recreational reasons, not for water quality reasons. So if they want to build at 9 cents, they had better stop putting recreation into a water quality certification.

Senator BRADLEY. Are you up to that challenge, Mr. Silkman?

[Laughter.]

Mr. SILKMAN. I certainly am, Senator. In 1983 we enacted in the State of Maine what has generally been referred to as the most comprehensive rivers bill of any State in the country. We surveyed 33,000 miles of rivers in the State—our total river supply—and identified over those 33,000 miles of rivers, 1,100 miles of rivers which we set aside as being undevelopable, for a number of different reasons, most of them having to do with the sport fisheries and other recreational values.

In addition, we classified the rest of our rivers in terms of whether they were A, B or C, depending upon a number of issues primarily associated with use, whether or not they handled significant effluent from major paper mills, for example. Whether or not they have the opportunities and are part of our fisheries management plans, which again relate to all 33,000 miles of those rivers.

When we look at any facility in the State of Maine, we look at it in the context of our overall rivers plan for the State. That may be rather unique, I do not know. Mr. Conrad says Maine and Oregon are unique. I have no evidence one way or the other in that regard. But what we do is we look at it in the context of what we see as the future of those 33,000 miles of rivers. We believe we make wise decisions, based upon that mileage. We know that we are licensing, or at least recommending to FERC that we license without significant water quality conditions.

Other facilities in the State, which are tied directly, for example, to paper production in the northern part of the State. We know that we regularly restrict what State agencies can extract from developers on existing facilities with respect to minimum flow, with respect to recreational benefits, because those rivers and those facilities are not part of the high value river systems that we have identified.

We believe that we have done a good job in making those determinations, subjected to long, extensive public participation processes throughout the State, regularly reviewed and updated through our legislature. We think we have a good job, and quite frankly, we are very concerned about having the FERC exercise veto power over those decisions that we have made in the State of Maine.

Senator BRADLEY. All right, let us move on, if we can, to another question, and that relates to the size of, or exemption from Federal hydroelectric licensing. 1.5 up to 5? No one has objected to the provision in the bill that exempts licensing for projects of 5 megawatts or less; is that correct?

Mr. CONRAD. No, Mr. Chairman, we do object to the deregulation of hydro-electric power less than 1.5 megawatts and also less than 5 megawatts.

Senator BRADLEY. So you object to it if it is 2 megawatts?

Mr. CONRAD. That is right, unless the State and Federal environmental controls are maintained.

Senator BRADLEY. And you object, too, Mr. Echeverria?

Mr. ECHEVERRIA. Yes.

Ms. GREELY. The National Hydropower Association would prefer to see this provision be optional, precisely for the same reasons that have been mentioned by the other members of the panel. We do not know what will replace the FERC system in the event that a 1.5 or 5 megawatt cutoff goes into place. Therefore we think it would be more appropriate for it to be voluntary, similar to the current exemption program, essentially expanding——

Senator BRADLEY. Voluntary by State?

Ms. GREELY. By the applicant, as the exemption program currently is.

Senator BRADLEY. I thought his point was that the reason this would only work in Maine or Oregon is because they are the only States that have the regulatory mechanism in place.

Ms. GREELY. Right, that we do not know what will come after. Some of the other States will probably develop regulatory systems of their own, and that in the future the licensee can, as they do with the current exemption process, look at the processes in front of them and decide which is the most efficient way to go. I think both could assure adequate environmental protection, particularly with the provisions that are in the Federal process to protect the environment.

Mr. SILKMAN. Senator, could I try take a slightly different tack on this issue? 1.5 or 5 megawatts does not seem like it makes any sense; it seems to be an arbitrary number that has been established for no real good reason that I can see.

It seems to me that one way of approaching this problem is to identify those facilities where those river stretches that are wholly within a State, where there are no interstate effects, and where navigation is not a significant issue, which was the whole reason for the Federal Power Act to begin with. And indicate that any facility on those river stretches ought to be exempt if a State can demonstrate that it has the capability, according to a number of objective criteria, that it has the capability of dealing with its river systems.

That seems to make an awful lot more sense than this notion of identifying 5 megawatts or 1.5 megawatts, and saying that anything below that some or another is a State responsibility, and anything above it is FERC's responsibility.

Senator BRADLEY. So that instead of us providing a blanket approval for all below, or a blanket exemption for all below 5 megawatts, we should approve the regulatory plan or mechanism that a State might have to regulate rivers only within its own boundaries?

Mr. SILKMAN. That seems to me to be a reasonable approach, again recognizing that the Federal Power Act was established for those reasons to begin with.

Senator BRADLEY. That is an interesting idea.

Mr. ECHEVERRIA. I agree with Mr. Silkman on most things, but I disagree with him on this one. We favor retaining FERC jurisdiction over projects regardless of their size, and I agree with Mr. Conrad's comment that there is a question about the State's regulatory capacity to deal with the whole gamut of hydropower raised even by smaller projects, except in a few instances.

One of the important consequences of this provision would be that, with the FERC jurisdiction, under the Federal Power Act eliminated the Fish and Wildlife Service and the National Marine Fisheries Service, would not have standing to participate in the State proceedings. The expertise in terms of anadromous fish restoration, the design of fish ways and so on, resides in those Federal agencies, and that should not be lost in this process.

Thirdly, rivers are a somewhat unusual resource in that the resource is mobile—the water flows, the fish go up and down the river—you need to analyze rivers and manage them in a comprehensive fashion. The Federal Power Act addresses the need for comprehensive planning and directs that the Commission make licensing decisions in view of a comprehensive plan for an entire river.

This obviously has the most force in the case of the migratory fish, where the fish have to get from the mouth of the river up to the spawning grounds and the headwaters, eliminating FERC jurisdiction over some projects and not over others. It would make it harder, we think, to develop a coherent regulatory approach that is comprehensive in nature.

And finally, I guess I am concerned by Ms. Greely's suggestion that the process should be optional. I think that would encourage forum shopping, in which individual hydro developers in different States would select either the Federal route or the State route, depending upon which route they felt would present the fewest regulatory barriers and environmental requirements. I do not think that process would be in the public's interest.

Senator BRADLEY. Let me ask you, is there any way in your mind that the licensing does not ultimately involve some kind of conflict between competing interests for power production and recreation and fish, wildlife, water supply? I mean, is it inevitably going to involve some trade-offs?

Mr. CONRAD. Yes. There will always be competing interests for water resources, I think, and increasingly so as we move into the future.

Senator BRADLEY. But can you imagine any circumstance where certain environmental values might be sacrificed in order to promote or permit hydroelectric development?

Mr. ECHEVERRIA. I think they are constantly sacrificed in the current process. The Fish and Wildlife Service and the National Marine Fisheries do not prescribe fishways willy-nilly to any dam that comes up for review. They do so, taking into account the considerations of cost and the biological program.

I discussed this in some detail in my testimony in relation to New England, where the Fish and Wildlife Service has targeted it is section 18 authority at a few specific rivers where it thinks it is going to work well. And it has not asked that substantial cost of constructing fish passage facilities be incurred in other areas.

Senator BRADLEY. Let me ask you, can you tell me any hydroelectric projects that you do support?

Mr. ECHEVERRIA. I think one project that really deserves credit is the Summit Pump Storage Hydroelectric project that has been licensed or is on the verge of being licensed by the Federal Energy Regulatory Commission in the State of Ohio. I think it has a capacity of 1,000 megawatts, an enormous pump storage facility which is being constructed, as I understand, essentially in a cornfield with an existing underground cavern, and an upper reservoir is being constructed on the surface. That difference in elevation allows for generation of enormous amount of power, with essentially no adverse environmental impacts.

Senator BRADLEY. I am not familiar with this project. It sounds to me as if you had just described water flowing into a cave.

Mr. ECHEVERRIA. That is exactly right. There is another project of the same nature proposed in the State of New Jersey.

Senator BURNS. If you do not mind, I would like to get a schematic of that. I may want to put one in my cornfield.

[Laughter.]

Mr. SILKMAN. Senator, you talked about conflicts, and I think that there are always conflicts that will be associated with these facilities. One of their very frustrating things that we fact in the State, and let me try to give you an example.

Mr. Echeverria just a moment ago mentioned that FERC tries to look up and down a river stream or whatever, when it is doing its relicensing decisions. Even if they are successful, let me use a traffic analogy. Oftentimes, we feel like when we are in front of FERC on a relicensing decisions, they are making a decision about whether or not to put this traffic light at an intersection, without regard to what is at the next intersection, or what was at the intersection before it.

In the best of circumstances FERC will look upstream and downstream, that is up the street and down the street, to measure traffic flows, but they will never, ever look two blocks away to determine whether or not there is a highway, or whether or not there is a shopping center, or whether or not there is any activities going two blocks away which will affect what you will like to see happen on that street in a community.

We try to do that in the State by looking comprehensively at all of our rivers, and when we approach FERC from that perspective, we are frequently met with, we do not deal with those issues because they are what they call out of basin. Since they are out of basin, they are not subject to consideration.

That is incredibly frustrating to us, as you might imagine. It would be as if you are trying to run traffic in a town, and you are talking to Federal traffic engineers, and they say, well we do not pay attention to that street; we are only focusing on this street. And, as I say, when you are trying to look 33,000 miles of river, it is enormously frustrating.

Senator BRADLEY. I think that is a good point. Let me ask, if I could, either Mr. Echeverria or Mr. Conrad. In Mr. Hunt's testimony, he has a number of very interesting charts, one of which—and I will describe them in case you have not seen them—is this chart on the hydro applications and new projects, where there is a peak of over 2,000 in 1980, and it suddenly drops to 200, or 152 in 1990. Now, to what do you attribute this drop, and then Mr. Hunt, you might tell us, to what do you attribute the drop.

Mr. CONRAD. Mr. Chairman, we refer to that period as the hydropower gold rush era. It came on the heels of some incentives that Congress enacted in 1977. And 1980 some tax incentives and some regulatory incentives for hydropower developers. It was a period, particularly when the Public Utility Regulatory Policies Act was in operation, where Money magazine, for instance, had articles saying to backyard-type developers, go out, build a dam, file with the Federal Energy Regulatory Commission. Many, many of those projects did not have the kind of engineering, sophisticated analysis that ultimately they discovered they needed. They began to drop out very quickly.

Tax incentives were also eliminated in the 1986 Tax Act, and that took about an 11 percent away from this business.

Senator BRADLEY. Are you saying that you think that this 1980 figure is, from a historical standpoint, high anyway?

Mr. CONRAD. And a complete anomaly, based on some incentives that the Congress enacted and then began to repeal a little bit afterwards.

Senator BRADLEY. Mr. Hunt, what do you say to that, in defense of your chart.

Mr. HUNT. Well, there are several factors, I think. Number one, the three-stage consultation process was put into place after that point, which lengthened the process licensing much longer than it was before. The cost of licensing has risen 300 percent, as I talked about before. The cost of developing a project is 70 percent higher, and the exemption process which—quite a number of those projects were at existing dams, very small facilities—the exemption has sort of been adjudicated out of FERC's control, with the mandatory conditioning authority.

So I think there are several factors that contributed to that.

Senator BRADLEY. So your point is that, do you dispute what Mr. Conrad has said, that the increase was related to the subsidies?

Mr. HUNT. There were incentives to become energy independent that helped, certainly. I do not dispute that at all. But the fact that the process is now much longer also discourages people from applying. People are not applying because, and in fact recently a 2,000-megawatt pump storage application was withdrawn during the preliminary permit process, because it takes too long to go through it. They were going to buy combustion turbines. So, I think that has a great deal to do with it.

Senator BRADLEY. So your point is that this is a result of regulatory excess and not loss of subsidy? I mean, how would weight the two? I am trying to see what bang we get for the actions in this bill.

Mr. HUNT. I think the regulatory process has a lot to do with it, but the smaller projects—a lot of those were small projects, and definitely they were affected by removal of the tax credit. In terms of megawatts——

Senator BRADLEY. So you mean as soon as we stopped allowing tax shelters in these projects they dried up, just like as soon as we stopped allowing tax shelters in real estate they began to be built less?

Mr. HUNT. Well, the difference is that now the applications that are being filed have an average capacity of above 5 megawatts, and back then the average was around 1 or 1.5 of all of those numbers. So I think the smaller projects economically——

Senator BRADLEY. If you were going to pick the two regulatory things you would like to change, what are they? I saw your testimony, but if you would tell us two of the things that would make the biggest impact on this.

Mr. HUNT. I do not think we need a three-stage consultation process as such. I think three times around the horn is entirely too many. Everybody can sit down and get together and look at things, and come to some consensus as to where the studies go and then the application can be filed at FERC. And FERC can actually be involved in the initial part of that process, which is its currently not now.

I think some of the megawatts that have been licensed in the past, if we could extend the time when they have to begin construc-

tion—currently 4 years—so that economics can catch up with some of these long periods of licensing would help as well.

Senator BURNS. I have a couple of questions. Mr. Silkman, I just noticed in your testimony here, page 5, you state S. 341 effectively revokes the existing State authority to condition water quality certification under the terms of section 401 of Clean Water Act. Is that a little overstatement?

Mr. SILKMAN. There are two aspects of it that I think are important. The first is that S. 341 would allow FERC to overturn any ruling that the State made, and hence veto any actions that the State was taking. Admittedly, those would be outside of what might be regarded as strict water quality issues. But I think it is important, Senator, to remember that our rivers are used for multiple purposes.

Senator BURNS. I have a couple of questions here. Mr. Echeverria, I noticed you have responded over here that Mr. Hunt's statement to do away with the three-stage process you have to go through to get the license. Would you agree with him, or would you——

Mr. ECHEVERRIA. I would agree that the process needs to be shortened and reformed, and can be and should be without any environmental effects. This is a very important point, because I think everybody on this panel agrees on that point and agrees that it would improve the efficiency of the process and agrees that it would not have any adverse environmental effects.

Ms. GREELY. Senator Burns, excuse me. Could I comment on Mr. Echeverria's statement, because I think we actually are in agreement here? I think what happens——

Senator BURNS. Wait a minute, we do not want lightning to strike.

[Laughter.]

Ms. GREELY. I will try not to let this be too dramatic a moment. What happens right now in the process is that you go through a three-stage consultation without FERC. You do with all the other agencies in the process. But FERC is sitting in Washington waiting for you to finish your application. You finish you consultation, you prepare your application, you take it to the FERC and then they start the NEPA process with it, and start going through their various steps, including more comment and consultation with the same agencies.

I think what we could probably agree on is that we ought to take FERC and put them up front, and sort of merge those two stages together. We think this probably can be accomplished through the FERC's own regulations, and we are anxious to see the outcome of a review of this within the FERC now.

Senator BURNS. Mr. Conrad, would you like to comment?

Mr. CONRAD. Yes, I would. As Gail said, this can be accomplished FERC's regulations. I don't believe that statute is necessary for that. But I do think that the assistance of this committee, maybe with a letter to the Commission, urging that the Commission follow the Council on Environmental Quality's NEPA guidelines as they apply to FERC licensing, would be very helpful.

Senator BURNS. Mr. Conrad, while we are on that, would you agree that once the process starts, would you agree to some type of

a time limit set on the complete studies, even under the Endangered Species Act or under NEPA?

Mr. CONRAD. Well, there are certain time limits in the Council on Environmental Quality's guidelines as to public comment periods, things like that. And also, under the Endangered Species Act, there are certain time requirements, and so I think I, myself, believe that the current in those regards are adequate and well formulated for resolving these issues.

Senator BURNS. You see, it is my opinion that we let time stretch out. And appeals and everything else in regard to those type of things increases the cost, and pretty soon you have pushed a project way beyond its own schedule, and it becomes now just like I say I have some questions, I appreciate the patience of the chairman today and his sense of humor, and that he would do this. I will have some questions for you. I got all shook up whenever you folks turned my water off up there in Nebraska, so I couldn't irrigate my corn just for the cranes. But I didn't see the cranes on the river; they were in my cornfield.

[Laughter.]

Senator BURNS. I am going to take you out there and show you a few things that you do not know about cranes, so thank you very much.

Senator BRADLEY. We will leave the record open for any questions through tomorrow, and to any supplements to the record for the next 2 weeks.

Let me thank you witnesses for testifying. I think it has been a very good back and forth. I think there have been a number of good suggestions come out of this, and just for the record, that is c-r-a-n-e-s.

[Laughter.]

Senator BRADLEY. Thank you. The committee stands adjourned.

[Whereupon, at 4:40 p.m., the hearing was adjourned.]

[The following statements were submitted for the record on February 26, 1991:]

PREPARED STATEMENT OF GREGORY M. RUEGER, SENIOR VICE PRESIDENT AND GENERAL MANAGER, ELECTRIC SUPPLY PACIFIC GAS AND ELECTRIC CO.

As the nation's largest investor-owned operator of hydroelectric generating facilities, PG&E firmly believes that the hydropower provisions of S. 341 offer important improvements to the present regulatory scheme for hydropower. These provisions are found in Title IV—Renewable Energy, under Subtitle C—Hydropower. These provisions would do much to strengthen the ability of the Federal Energy Regulatory Commission (FERC), as the responsible administrative agency in this area, to integrate the diverse considerations involved in licensing hydroelectric generation and to produce timely and comprehensive decisions.

Hydropower is the most readily available renewable energy resource in the nation today. As the nation embarks on establishing a sound national energy strategy to carry us into the 21st century, it is vital that government support efforts to enhance the ability of both the private and public sectors to preserve and expand this clean, renewable domestic resource. S. 341 will make a major contribution towards these efforts.

The hydropower provisions of S. 341 represent sound environmental and regulatory policy. All current environmental reviews and considerations in hydropower licensing will be preserved. However, overlapping environmental reviews and the possibility of conflicting agency license requirements will be eliminated. The single agency with the greatest expertise in hydropower licensing will be reaffirmed as having administrative responsibility for finding the balance among all competing concerns which best serves the public interest.

Congress designated the Federal Power Commission, FERC's predecessor, to be the agency principally responsible for hydropower. FERC still has that role, but with the expansion of factors affecting the licensing and operation of hydroelectric projects, clarification of the statute has become necessary to avoid growing regulatory inefficiencies, delays, and conflicts.

As proposed, the hydropower provisions of S. 341 would do these important things:

Consolidate all provisions in the Federal Power Act for protecting non-power interests on hydropower licenses. Specifically, protection of resources on Federal reservations, presently addressed in Section 4(e) of the Act, would be combined with the existing protection for fish and wildlife, recreation, flood control, and other concerns of Federal and State agencies contained in Section 10(a) of the Act. Inclusion in Section 10(a) makes sense because this section requires FERC to consider agency (and Indian tribe) recommendations on all these topics as part of FERC's key responsibility to assure that hydropower projects are best adapted to comprehensively use and protect the varied resources affected by hydropower.

Clarify the purpose and scope of the State water quality certification required for hydropower projects under Section 401 of the Clean Water Act to insure that discharges from these projects do not adversely affect water quality. It would prevent the use of this statute to regulate matters which have nothing to do with water quality.

Eliminate the ability of the Secretaries of Commerce and the Interior to require the installation of fishways (fish passage facilities) at hydropower projects, leaving this to the discretion of FERC in the licensing process.

Direct several departments to identify cost-effective opportunities to increase hydropower production at existing federally owned or operated dams and similar facilities.

Attached to this statement is a background document summarizing the importance of hydroelectric power to PG&E and regulatory problems which S. 341 could help remedy.

[Attachment.]

THE IMPORTANCE OF HYDROELECTRIC POWER TO PG&E

Hydroelectric power is a significant part of the U.S. electric generation mix, providing about 12 percent of the capacity and 10 percent of the energy needs, nationwide. At PG&E, hydro is a very substantial component of our resource mix, at about 4 million kW. Hydro provides about 25 percent of our capacity and roughly 20 percent of our energy production, in a normal precipitation year. Even in a dry year (and California is now in the fifth year of drought conditions), hydro can still generally be counted on for 8 to 10 percent of our energy production.

Hydro potential nationwide was estimated by the Federal Energy Regulatory Commission (FERC) in 1988 at perhaps double (an additional 95 million kW) the hydro capacity currently existing nationwide (88 million kW). About one-fourth of this potential is estimated to be pumped storage. We believe that simplifying and streamlining the regulatory process is essential to helping these estimates to be realized.

Hydro's economic benefits to electric consumers are significant. Average hydro production costs are significantly lower than most thermal alternatives. As a significant component of our resource mix, hydro buffers swings in the cost of other resources.

Hydro's operational benefits include the ability to start, change load, and stop rapidly when compared with other resources. These features are valuable during normal operation as "spinning reserve" and also during emergencies when quick response is even more valuable. Pumped storage units provide unique flexibility to system dispatchers because they can swing from full power to full pump in a relatively short time period.

PG&E's Helms Pumped Storage Project combines the ability to generate 1.2 million kW of electricity to help meet peak electrical demand, with the ability to absorb a comparable amount of electric output during non-peak periods by switching to its pumping mode. This enables efficient baseload generation sources to operate around the clock, even during the otherwise low-load off-peak periods. In addition, the Helms Project can go to full load in just 5 minutes.

Another significant operating benefit of hydro systems is their ability to store water for hours, days, months or for years in reservoirs for power use when it is of highest economic benefit.

Hydro provides societal benefits at its reservoirs which provide flood control, aesthete, and recreational appeal to millions of Americans. PC&E has been in the hydropower business since the late 1800's. Our oldest operating hydro unit was commissioned in 1900 and our newest in 1986. We have over 80 public recreation facilities at hydro projects, with about 400,000 visitor-days of use annually.

Hydro provides these benefits without producing air pollution or many of the other waste products characteristic of other resources. To illustrate, if the electrical output of PG&E's hydroelectric system in an average precipitation year were provided instead by a typical coal-fired generation system, it would produce in excess of 100,000 tons per year of sulfur oxides (SO_x); PG&E's hydro resources contribute zero SO_x. Hydro does have some environmental impacts. Design and operational attention can minimize them but not eliminate them all. They are, however, fundamentally different, and thus not directly additive, with other resources' impacts. We view this as a desirable attribute of hydroelectric resources.

Regulatory Problems Which S. 341 Could Help Remedy

The current and future benefits of hydro are in jeopardy because of the regulatory process for hydro licensing. The process is inefficient, with considerable duplication of effort. Each state and federal regulatory agency pursues the goals it perceives to be its responsibility.

The current regulatory process fails to clearly establish a single agency as the responsible decision maker. While FERC has the authority to issue licenses for hydroelectric projects, other federal and state agencies and single purpose special interest groups attempt to elevate the importance of their goals in the FERC licensing process.

With multiple agencies having multiple opportunities to push their differing goals, we are concerned with the possibility of requirements for studies and mitigation which exceed project impacts and whose costs exceed the benefits of hydro generation. If this results in hydro projects being rendered uneconomical, existing generation may be lost and the growth of this desirable generating resource would certainly be slowed.

Difficult decisions must be made in balancing energy needs, consumer economics, and resource protection. A regulatory framework in which a single agency is clearly entrusted with overall jurisdiction and the responsibility to make those difficult decisions is the best way to ensure that a proper balance is struck. We support a reaffirmation of the Federal Energy Regulatory Commission as that jurisdictional agency. S. 341 will make a major contribution toward this goal.

Here is one example of a current regulatory jurisdictional conflict. The federal land management agencies, including the Department of the Interior's Bureau of Land Management and the Department of Agriculture's Forest Service, are actively promoting their position that they can regulate all aspects of hydro projects and supersede FERC's best comprehensive planning authority via their mandatory conditioning authority under Section 4(e) of the Federal Power Act. S. 341 would address this 4(e) jurisdictional conflict between federal agencies.

Prepared Statement of Morgan Dubrow, Chief Engineer, National Rural Electric Cooperative Association

Mr. Chairman, my name is Morgan Dubrow, Chief Engineer of the National Rural Electric Cooperative Association (NRECA). NRECA is the national association of more than 1,000 rural cooperatives which supply central station electricity to some 25 million people in the rural areas of 46 states.

This statement sets forth NRECA's positions on S. 341, Subtitle C—Hydropower Sections 4201, 4202 and 4203 of the "National Energy Security Act of 1991."

Mr. Chairman, since its enactment in 1920 the Federal Power Act [and subsequently the Federal Energy Regulatory Commission (FERC)] has provided for the licensing of hydroelectric power projects, customarily for a term of 50 years. Such licenses include stipulations to require the licensees to provide for minimum flows, fish and wildlife protection; provisions for recreation; some conservation measures, and other requirements to maximize the overall benefits of the project. Further, in many instances such projects provide some flood control and navigation benefits. Having accounted for these things, the FERC provides assurances, or guarantees, to licensees warranting that the project can be operated in such a way that the electric power can be produced and marketed at rates that repay all project costs. Such a provision is essential—otherwise the project would not be built.

NRECA supports Sections 4201 and 4202 of S. 341 which strengthen the licensing provisions of the Federal Power Act to operate the project for maximum power production within the stipulated terms and conditions set forth in granting the license.

The federal government has developed many multiple-purpose projects and in so doing has attempted to adequately provide storage municipal water supply and irrigation for flood control, and navigation, as well as recreation, conservation, protection of fish and wildlife, etc. The Colorado River Storage Project (CRSP) is one such project and it includes a very large storage dam, namely Glen Canyon. This project stores water for the Colorado River which over the past 100 years has experienced flow which ranges from about 5.4 to 24.0 million acre feet (MAF) yearly. The average flow is 11.9 MAF. Glen Canyon provides for flood protection, municipal water and irrigation storage and other purposes. The reservoir includes a power pool designed and operated for the production of peaking power. This power operation provides annual revenues to pay over 90 percent of the project costs.

NRECA supports the present method of power operations and so indicated in testimony before the Senate Water and Power Subcommittee on the so-called "Grand Canyon Protection Act" on July 24, 1990, in which we stated:

> NRECA recognizes that society's needs and interests shift over time. Government should address those changing circumstances. Water rationing in California communities is a problem for all of us to help solve, because we may have a bigger problem next time. Recreation is essential for society and can provide commercial economic opportunities in rural areas. However, changing basic federal policies for managing water ought to be done through a process like that advocated by Senator Hatfield in S. 1996. It should not be done to accommodate rafters under the "smoke screen" of an emergency condition to avert major damage to the Grand Canyon.
>
> NRECA continues to believe that clean, renewable hydro-power serves the national interest and its production should be emphasized over less clean sources. Glen Canyon Dam, with a capacity of 1356 MW, supplies power to 58 rural electric cooperatives and other preference customers in the Upper Colorado River Basin. Moreover, the Glen Canyon powerplant supplies about 70 percent of all the power that can be generated at Colorado River Storage Project (CRSP) dams in the upper Colorado River Basin. Glen Canyon power is co-mingled with large amounts of power from fossil-fired plants to serve residential farms and ranches; however, despite this co-mingling of relatively inexpensive hydropower, the rates for these preference customers are still high.
>
> To the extent that water flows from Glen Canyon are changed to levelize the flows as prescribed in S. 2807, the electric capacity and energy will have to be replaced with fossil-fueled units. That appears to be the opposite of the direction Congress and the Administration are taking in the clean air deliberations.

Furthermore, it would mean that the ranchers' and other rural customers' overall power bills would increase as much as $30 million each year.

NRECA also supports Section 4203, "Improvement at Existing Federal Facilities." This Section is designed to have the Secretaries of the Interior and the Army "perform studies" of cost effective opportunities to increase hydropower production at existing federally owned or operated water regulation, storage and conveyance facilities. Studies are to be performed for each of the nation's principal river basins to seek opportunities to improve efficiency of hydroelectric generation use of water, create additional generation of hydroelectric power, with due consideration of the cost effectiveness of such efforts with full and due consideration of the environmental consequences.

Thank you for the opportunity of presenting NRECA's views and recommendations on this important proposed legislation.

Pete Wilson, Governor

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FEB 25 1991

Honorable J. Bennett Johnston, Chairman
Senate Energy and Natural
Resources Committee
United States Senate
Washington, DC 20510-1802

Dear Chairman Johnston:

SENATE BILL 341 HYDROPOWER PROVISIONS

On Tuesday, February 26, 1991, the Senate Energy and Natural Resources Committee will conduct a hearing regarding the hydropower provisions of S. 341. These include a provision, Section 4201, which would effectively take away state authority to apply its water quality requirements to hydropower projects licensed by the Federal Energy Regulatory Commission (FERC). This section should be removed from the bill.

I. To Assure Coordinated Regulation of Factors Affecting Water Quality, States Must Have Certification Authority

Hydropower projects have the potential to substantially affect water quality. Problems include changes in temperature, turbidity, dissolved oxygen and algal productivity caused by dam operations, and siltation caused by project construction. These problems, if not avoided through appropriate permit or license conditions, may completely destroy the fishery in affected rivers and streams.

The states must have authority to address these impacts if water quality is to be protected. As is recognized in the California Water Code, achieving water quality standards requires "the coordinated control of all factors which affect water quality." (Cal. Water Code § 13141(c).) FERC does not have the ability to achieve this kind of coordinated control. FERC has jurisdiction over only about 500 of the over 14,000 water projects in California, and no authority over other factors, such as municipal, industrial and agricultural discharges, which affect the same waters.

Until recently, the California State Water Resources Control Board relied on water right permit conditions, including conditions in the state permits issued to FERC licensed hydroelectric projects, to assure coordinated regulation of factors affecting the State's water resources. But a recent United States Supreme Court decision (California v. FERC) severely limits state water right authority over FERC licensed projects.

States still have some authority to apply their water quality requirements to FERC licensed hydroelectric projects under Section 401 of the Clean Water Act. Any federal permit or license for an activity which may result in a discharge is subject to state certification. The State may impose as a condition of certification any appropriate requirements of state law. These conditions must be included as conditions of the federal license. Section 401 of the Clean Water Act is not the answer to the U.S. Supreme Court's decision. The State's concerns often go beyond water quality impacts, and even as applied to water quality the procedures governing certification often make it difficult for the State to regulate effectively. Nevertheless, Section 401 is a valuable tool for the protection of water quality, and may be the only means available to the State to ensure it has some say over the water quality impacts of hydropower projects.

II. S. 341 Would Effectively Eliminate State Certification Authority

The provision of S. 341 on 401 certification, Section 4201, would severely limit the State's ability to protect water quality through use of its certification authority.

Section 4201 of the bill would prohibit the State from imposing any condition of certification which is not "needed" to ensure that the construction and operation of the project will comply with specified sections of the Clean Water Act. These sections include Section 303 of the Clean Water Act, which provides for beneficial use designations and water quality criteria. Section 4201 would further provide that FERC will decide if the State's conditions of certification violate this prohibition. Under current law, the validity of the State's certification conditions is reviewed in state court.

State certification authority would be all but useless if FERC could ignore the State's certification conditions

whenever FERC determines those conditions are not "needed" to meet Clean Water Act requirements. FERC has interpreted Section 303 of the Clean Water Act more narrowly than either the State or the federal Environmental Protection Agency (EPA), excluding many characteristics of water from its definition of "water quality".

FERC could also use the authority provided by S. 341 to second guess the State's determination of what controls are appropriate to meet water quality standards. For example, if the State sets certain conditions to meet turbidity criteria, FERC could reject those conditions on grounds that the State should instead meet those criteria through stricter controls on agricultural or silvicultural activities. FERC may also interpret S. 341 to allow it to second guess the State's water quality criteria and beneficial use designations. FERC could reject the State's criteria as more restrictive than necessary to protect the fishery, or reject State's designation of the fishery as a beneficial use to be protected.

Setting water quality standards often requires careful judgment about competing needs for limited water supplies. For example, where water quality standards cannot be achieved without increasing instream flows, it must be decided whether meeting those standards is feasible considering the impact of higher instream flow requirements on water projects. The Clean Water Act and EPA regulations assign these determinations to the states. Under S. 341 these decisions would be made by FERC. FERC has shown a strong interest in promoting hydropower, and an inadequate understanding of competing needs of other uses. If the hydropower provisions of S. 341 are enacted, the states will find that standards set to protect municipal, industrial, agricultural, or instream beneficial uses may be ignored whenever FERC believes those standards would interfere with operation of a hydropower project.

In addition to taking away state authority, S. 341 would include another provision, Section 4202, taking away the authority of federal land management agencies over hydropower projects within the lands they manage. The combined effect to taking away both state authority and the authority of the federal agencies primarily concerned with the environmental impacts of hydropower projects could be severe damage to rivers and streams in California.

III. The Nation's Energy Needs Do Not Require Limitations on State Authority

The hydropower projects which would benefit by taking away state certification authority will not significantly contribute to the nation's energy supply. The hydropower projects in California now pending for water quality certification and FERC licensing tend to be small, run-of-the-river projects. Although these projects may have significant impacts on affected rivers or streams, they do not generate much electricity. Because stream flows vary greatly from season to season and year to year, these projects are not a reliable source of energy. Further, most of the electricity is generated during spring snowmelt, when power demands are lowest and power from other sources, including other hydroelectric projects, is most abundant.

The additional electricity generated by these projects is a tiny fraction of the energy that could be saved through additional conservation. For example, the California public utility likely to obtain the most additional power from new hydroelectric projects in the next several years is the Pacific Gas and Electric Company (PG&E). Yet a recent California Energy Resources, Conservation and Development Commission report, Electricity Report 90, projects that new hydropower projects will add only 10 megawatts of power to the PG&E system in the next several years. By contrast, the report's recommended energy forecast indicates that conservation measures reducing demand on the PG&E system by over 1100 megawatts should be carried out over approximately the same period.

This fifth year of drought has highlighted a need for coordinated regulation for water projects in California. The hydropower provisions in S. 341 would be a step in the wrong direction, and provide little or no benefit to meeting the nation's energy needs. The bill should not include any limitation on state authority over hydropower generation.

Sincerely,

W. Don Maughan
Chairman

Note: Same letter sent to Senator Alan Cranston and Senator John Seymour